SUMMER IN A BOG

KATHARINE DOORIS SHARP

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SUMMER IN A BOG

By

KATHARINE DOORIS SHARP

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To My Husband

IN WHOSE COMPANIONSHIP, IN HIS PROFESSIONAL DRIVES
THROUGH THE COUNTRY, MY FIRST ACQUAINTANCE
WAS MADE WITH THE FLORA OF MADISON
COUNTY, OHIO, THIS LITTLE
BOOK IS INSCRIBED.

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Foreword.

Let me confess, at the very beginning, that I do not know what is the accepted nature of a *foreword.* In this instance it is the conviction which has come to me at the very end of the work; for the following pages, compiled from the columns of periodicals in which most of them appeared some years ago, seem to ask of their author, "Is it worth while?"

It was in the company of my children that many of the experiences here recorded took place. As the sturdy lads tramped off into the woods and fishing-places of the countryside, it became evident that we must have some pursuit in common to hold us in sympathy.

Natural bent sent me to the company of the botanists. Dear, delightful Asa Gray! The slighted knowledge of schooldays was reviewed, and by a more appreciative pupil. Not all at once, but little by little, the friendship grew. To how many confidential, pleasant hours the Earth has since admitted me, I can not count.

With Britton and Brown's "Illustrated Flora of the Northern United States and Canada" as authority, the flora of Madison County, Ohio, has been mounted and classified, so far as it has come within reach.

There is no ennui, no heavy time to kill, when all around us secrets of Nature invite to revealment. Then, secrets no longer, let us while away a little time in recording them.

So, if anything is learned from these pages, if any impulse in the right direction proceeds from them, or if they furnish only the entertainment of an idle hour, they are worth while.

That the reader may have full measure of the pleasure and profit of the years' work, I will conclude by revealing

a process discovered while experimenting in mounting botanical specimens.

Do you like scrap-books, and to have at hand a paste which never decays, which you can compound at will? Such a paste, I know by many years of home use, is a valuable household article, and here, for the first time, I make it known:

One-half ounce of corrosive sublimate dissolved in one pint of alcohol. This amount will last a long time for home use, and should be kept tightly corked in a bottle on which the label for poison, furnished by the drug store, is pasted. This bottle should be kept by itself in a place not likely to be disturbed.

About one tablespoonful of this solution—the amount may be guessed at in pouring—stirred into a pint of well-boiled flour starch will make a paste which will keep indefinitely, unless exposed to air, when it will dry up. The heat of summer will not sour or spoil it. Should it freeze in winter, its quality remains unimpaired. When used for paste, denatured alcohol may be supplied. No metal should be brought in contact with the paste, as corrosion will result.

K. D. S.

Summer in a Bog.

The cornfield sloped away from the road and looked flourishing enough save at one point: there a strip seemed given over to weeds and black morass, to wild grasses and moss. Great clusters of ulmaria blushed pink and enticing through the early summer, followed by queen-of-the-meadow, tall meadow-rue, and flat-top white aster, as the season waned.

"If I owned that cornfield, I 'd drain it better," said the Doctor, critically, as we drove past it one afternoon.

"It 's just like a strip of lovely flowered ribbon," said I. "Here, stop and let me off. I 've been intending to visit that bog for more than a year, and I 'll do it now. It 's one of those things which I neglect because they are so conveniently near. Drain that bog! Of course they will!"

Any other time the Doctor would have found a dozen reasons why I should sit still and continue my ride, but my resolution came so suddenly that he had not time to formulate an objection. So I was down on the road in a jiffy, trowel and portfolio in hand.

"'Ribbon!'" he muttered, half aloud, as he drove away. He may have thought I had discovered a possible bargain counter in the mazes of the weeds.

I may as well confess that he has very little sympathy for these excursions into woods and swamps. He has visions of snakes and other possible terrors which, I am glad to say, rarely enter my mind. His care and forethought are appreciated, but sometimes disregarded.

Crawling through a wide space in the barred fence, I found myself in a wilderness of weeds almost as high as myself. Beating these to right and left, an open spot was soon attained where the decorations of the "ribbon" came to view.

How the spirits rise at sight of new acquisitions for a botanical collection! The crimson swamp milk-weed is an old acquaintance, worthy to adorn a garden. It marks the line of moisture oozing from a hidden spring.

The hot August sun was half-way down the Western sky and the light was excellent for revealing the smaller undergrowth, which, in subsequent morning visits, I found it hard to discover. However, this is a favorite trick of Nature, the apparent caprice of inexorable laws. The moment was favorable.

The soil was black and, on the upper slopes,

dry, the humps and tussocks furnishing a soft, if uneven, carpet to the feet. Here and there were spots entirely bare of vegetation, sour and barren, the mineral ingredients having leached out in the persistent washings of the springs, seeping up in holes and running in thin threads of water through rusty-black borders to the roots of the corn a few yards below. Several rods further down the slope, Mink Run crosses this young alluvial plain, which is being redeemed from its condition of a swamp into the uses of agriculture as the finest corn land—when, at times, treated with lime or potash and properly drained.

What is this odd, grass-like plant with tiny barbs along the side, reminding of a fish-hook? It is the arrow-grass, a new trophy; and near it was another, the capillary beaked rush, which seemed bent on taking the place of grass in the burnt-looking soil.

A group of Indian grass on a dry slope would have aroused the acquisitiveness of the horticulturist, with its graceful, silvery plumes gently swaying in the summer breeze. Nearby, a huge block of stone partially buried in the soil, lifted its sub-angular surface invitingly for rest after the labors of digging specimens among the matted root-stocks of the peaty bog.

There are many such stones scattered over the fertile fields of Ohio in this latitude, strangers brought from Northern lands so many thousands of years ago, telling a story of bygone epochs in the earth's mysterious formation.

Seated on this granite boulder, along the horizon and near at hand I see lines and groups of rounding hills, accumulations of sand, boulders, clay, and gravel. Where these deposits are separate and in a measure distinct and stratified, they are known as kames. Most of the hills around me are composed of boulder clay as a foundation, or mingled with gravel and boulders.

On their sides are frequently gullies, the loose soil washed away by tempests of ages, the dead bones of them—the stones—exposed and revolting. Where these hills are low and lenticular, following each other in succession in the trend of the valley drift, they are known as drumlins. Sometimes, in woodland regions, long, winding ridges of sand and gravel extend for considerable distances, almost persuading a belief that, cycles ago, the hand of man has been at work erecting a dyke or, possibly, the roadbed for a car line. This is an esker, and Nature the only workman, aided by waves and wind, by heat and cold.

Near Springfield are many interesting deposits of this kind.

The hills of the terminal moraine abound in springs, and often on the slopes a green area will mark their presence. They feed the streams and swamps below.

It is not often that the composition of these hills is revealed in nature's order; but in the construction of the electric road, a slice cut from the side of the highest point exposed curious varieties of sand and gravel. A kame had given its secret to the casual beholder. In one place a broad vein of fine, dark sand, without any earthy admixture, came to view.

How I longed to know more, to be able to read the story of the past ages as this riven old hill was telling it! At first sight I had thought of the country as lacking in geological features. The undulating hills are covered with grass or woods. The smooth fields yield rich crops to the farmer, or serve to pasture his fine herds. But for geology?

Here are few outcropping strata to invite the geologist's investigation. When the builder needs sand for the mortar, or the road-maker gravel, these hills and vales are found, in places, rich in these requisites. In the near future, as the forests fail in their building supplies, concrete may take their place, and then this

sand and gravel will present its vast riches to the needs of humanity. But how came they here, and what is their story?

Sometimes the digger into the rich black muck of an alluvial tract has unearthed the skeleton of a mastodon, an extinct species whose remains are found also in far Northern latitudes.

Sometimes in the depths of the earth remains of vast forests are brought to light and give testimony.

To the geologist the story is a fascinating one, telling of a time when the climate of all this Northern world was warm, tropical even. Of a cataclysm, or, possibly, some orderly, natural force, which reversed the conditions and, during cycles of time which may be only guessed, sent at intervals of cycles the slow progress of ice sheets and glacial currents far down—as far as the 38th parallel of latitude—toward the tropics.

Some winter night, when the mercury is dropping to zero and below, when the flesh shrinks and shivers in the unexpected blizzard, let the fancy wander into the realms of possibility and dream that another invasion of ice has begun on earth.

The natural gas and the coal laid in for winter use have been exhausted, but the cold

does not diminish. There must be an exodus from the home and the frozen North. Are the avenues of travel blocked with ice? All the hardships and fatalities of perpetual winter must be faced or avoided. The tragedy of want and frostbite—stop! Shake aside the phantasm!

Last and youngest of the vast physical processes of the earth was the glacial ice-sheet which rested here. With slow encroachment it dragged its bulks over the land. In its periodical congealments from year to year, the loess—the flour ground from the rocks—with the boulders, pebbles, and sand, were gathered up in its progress and borne to this final terminus.

Here the sun's rays melted the ice masses, and their freight of drift lies in the moraines or is scattered over the fields, imbedded in the alluvium of succeeding ages.

There is a glacier—Malaspina, at the foot of Mt. St. Elias, on which sufficient material has collected in places to sustain the growth of a forest. Beneath this growth the glacial ice is 1,000 feet deep.

A similar forest, but of greater extent, growing on ice is found in Siberia, in the region, it is said, of the Okhotsk Sea. When boring for a well in the vicinity of this forest, at a

depth of 300 feet the ground was found to be still frozen.

During the winter of 1912 it was reported that a road on the line between Champaign and Logan Counties had sunk out of sight, leaving a lake behind, 160 feet in length and from four to forty-four feet in depth. A bridge, which disappeared at a previous time, was found at a depth of twenty-four feet.

Those who bore for wells in this and neighboring low lands, say that large bodies of water lie in the ground. It is not impossible that the cavities so existing were at one time occupied by portions of the ancient ice-sheet.

It is well to remember that North America was not alone in the vast operations of Nature which left these indubitable witnesses of her power. Over all Northern Asia and Europe similar glacial changes were wrought.

"The Geological Progress of Twenty-five Years," by Lewis G. Westgate, Ph. D., of Delaware, Ohio, has valuable information and suggestions on this branch of investigation:

"These facts and values are suggestive only, but they are sufficient to show that the ice age was a very long and a very complex period, the successive ice advances being separated by long inter-glacial periods in which the climate may have been as mild or milder than to-day; indeed, it is not certain that we ourselves are not living in an inter-glacial period.

"Earlier glacial studies, proceeding on the theory of a single ice age, placed together in many cases events which we now know belong to different ice-advances, but geologists have come to see that the unravelling of the events of the Pleistocene means an immense amount of detailed work, which will occupy many years to come."

This strip of bog is just as it was after the warmth of the sun had shone for how many centuries we can only guess, breathing into the alluvial deposits and setting the organic life in motion. The persistent flow of water from that black-rimmed spring has kept at bay the advances of civilization. Not even the strong hands which wrought the fine road I have just left, the National Road, could control the tiny water vein.

"A fine old road!" I said to myself, standing up to look toward the West, and taking in its smooth white line as it passed up the hill and out of sight.

See, leaning toward the earth, half-hidden by the luxuriant grass, an old mile-stone. Time was when the traveler from Cumberland, in Maryland, could journey by stage along this road to Indianapolis and keep tally of his distance by these records, then freshly cut and upright. Many an illustrious traveler has gone this way, not the least of whom was Lafayette, in whose honor a village was named some five

miles to the east. Somerford, in those days a promising hostelry for rest and change of horses, lies, a mile behind us, sleeping and belated since the time that steam cars drew the lifeblood from this route.

But hark! There is a rumble in the distance, and now a clear whistle announces a halt for a car which is borne along that parallel road by a power most wonderfully carried through an overhead wire.

The name of Sydney H. Short, the inventor of the electrical trolley car system, and a genius in electricity, is recalled by the passing car.

Little did the men who planned this National Road dream of any method of covering distance more speedy than the horse. But we, having seen steam harnessed and docile, and electricity the public and domestic friend, look forward with confidence to wings and the free highway of the air.

With what wonderful poise and assurance young Philip O. Parmalee passed from Dayton to Columbus in his Wright bi-plane (November 8, 1910), bearing his trophy of silks to a mercantile firm in Columbus! With what ease he skimmed across the heavens and out of sight, arriving with precision at his destination!

At the women's "Thimble Parties" you will

sometimes see a dainty silk work-bag, fashioned from some ribbon of that cargo, passed from hand to hand, while the incident is recorded in the light of personal observation. With the poet, they

"Saw the heavens fill with commerce, argosies of magic sails,
Pilots of the purple twilight, dropping down with costly bales."

This popular and gifted aviator lost his life while flying in his aeroplane at North Yakima, Washington, June 1, 1912. He is one of the many whose lives are sacrificed in the fields of air, endeavoring to add to man's powers of locomotion. The story thus far is tragical, yet new names of new adventurers are not lacking, and exhibitions of aviation are of every-day occurrence. Who can say when regular lines of aerial travel may be established?

But not yet, although the sleepy villages are awaking and renewing their youth under the influence of the electric roads and stations; automobiles, too, for the farmers have caught the spirit of speed, and flash swiftly about the country attending to their affairs.

We were speaking of the old National Road and of its modern rivals. With all the recent

innovations in competition, it can be truly said that this highway is one of our best inheritances from the fathers. Like all things true and well-wrought, it will never cease to be a blessing—if kept in repair.

All the while that my thoughts have been wool-gathering my hands have not been idle. A grass of the early spring, now withering on its bank, proves to be vanilla grass, or Holy Grass. In Iceland it is used to scent rooms and clothing. In Northern Europe this sweet-scented grass is spread before the church door. Does not that remind you of the ancient times, when the earthen floors of dwellings and even castles were covered with rushes, fresh every day? Ah! bogs were very plentiful in those days, before the invention of under-draining, to make the supply of rushes hold out.

Here at my side, in the thick mire of this sluggish stream, the greater bulrush is ready for the work, if so please you. The spike-rush and several varieties of sedge beautify the waste.

But bogs are growing fewer yearly in Madison County, owing to the network of tiling in the low fields and meadows. That way lies health and wealth.

The tramp of hoofs on the hard road stops, and a familiar voice calls to me—the rubber-

tired wheels had given no sound. I gather up an armful of spoils and make for the fence, noting as I pass along the buds for later blossoms.

"And what did you find on the ribbon counter?" asks the Doctor.

"The most wonderful bargains I ever saw! To be had for the taking! Not less than a dozen things here that I never saw before. And more that I had not time to see. How I hate to leave it; but I will come back soon. What do you think I saw there? Buds for the fringed gentian! What do you say to that?"

He said nothing, and we bowled along silently for some time.

An old man, straight and hale, came walking leisurely toward us. Heavy brows shaded bright gray eyes, which regarded us kindly.

We drew up for a little conversation, and the two men talked of the crops, markets, cattle, —the usual grind. Taking advantage of a pause:

"You don't remember the building of this road, I suppose?" I said.

"Not quite. It was built along here about the time I was born; that was in 1834, but commenced in '30. A good road, one of the best in America. It was intended to reach St. Louis, but I 'm not sure that it was ever

completed that far. The masons and stonecutters were French and German. The foreman of the gang was a Frenchman named Vandelyne. He knew his business and saw to it that the work was done right. Do you know why there 's such a lot of people poor?'' He turned his keen gray eyes to mine with a half smile in their depths.

''It 's half laziness and shirk and half ignorance. Poor people have poor ways and plenty of them. Here—maybe I ought to explain what I mean better. I have all respect for poverty. It is the virgin soil from which every man and woman produces according to labor and ability. Some get wealth and knowledge, and some do n't. When I just spoke of the poor I meant the 'do n'ts,' the shiftless, ignorant, dirty, lazy, self-satisfied people who ought to be treated for the hook-worm to see if it will help them any, as I hope it may. They 're the folks who retire to the city in search of 'a job' and the aid of charity, leaving us farmers to raise the crops the best we can without proper help from farmhands. Shirkers, every one of them!

''But there was no shirk to Vandelyne. Right up along the hills, there by your farm, they put in not less than two years, I 'm told. The limestone that the culverts and bridges

were built from was brought from the quarries near Columbus."

"A notable piece of work, and a credit to the builders!" said the Doctor.

"You may well say so! The stone was all broke by hand for the bed, eighteen inches deep. Heavy iron rollers pressed it into place. The horses were specially shod. On top of the broken stone was put gravel from which all the fine sand and small pebbles had been sifted. Then more rolling. They worked here in '36 and '37, I think. 'T was finished in '41."

"That 's a fine piece of road this side of Columbus—beats the old National. And say, a chauffeur remarked that the road of the future is to be paved with brick. What will the farmers say to that?"

The gray eyes smiled quizzically.

"It 's so far in the future, I reckon it needs no answer. It will keep till the time when the land is divided up and each one has his share." Then the old man chuckled knowingly.

"The philosophers who sit in libraries or loaf on street corners, talking about the division of land and property, are not hankering for the labor that goes with the acquisition and care of those things. Bless you, no. But they are dreaming of the division of ready-made incomes, easy money to be plucked from the

bushes. They are not practical. They want none of the toil, but a huge slice of dividend. Now, I know this: that not every man can be a farmer by just owning land. It takes a lot of practice and intelligence to produce good crops. One big mistake the millionaires make is bestowing all their endowments on colleges to make scholars, lawyers, and such like. And the cities likewise make generous provision for the coddling of paupers. The country is left to shift for itself the best it can. The homes in the country are often poor excuses, with no conveniences, no society, no amusements, no anything compared with the towns. I don't wonder that the poor take to coddling and go where they can get it. If the cost of living is to be reduced, some of the indulgences, charities, instructions, benefits, and all that sort o' thing 's got to be distributed around in the rural districts."

The old gentleman made to push on, but the Doctor had a remark yet to make.

"I notice young Wier is still at work in his gravel bank. What is he doing? I have been too busy to stop, but as you live out this way—?"

"You know his father bought that little place (the house is back on the other road) to try to recuperate his health, but 't was no

use. He faded away last March. We all thought the son would move back to the city, but it seems that he has set his heart on some scheme he has in mind. He says he 'll stick to the farm for a spell longer. He does n't say a word about his work in the sand, and he does n't encourage loafers about his shed back there; and to tell you the truth, we farmers are all a sight too busy about our own work to meddle with his. We 're like yourself as far as time goes—it 's the scarcest article in the market."

"Good luck to him, whatever it is. There 's nothing like trying. I 'll be glad to see these old gravel beds turned to some account. They do wash away if you try to farm 'em, that 's sure. So long."

As we drove on, my mind was still busy with the road, and when we took the way for home, branching to the south, some newly mended spots drew attention.

A fresh load of gravel on one of these roads can a tale unfold of deep interest to the geologist. As he scans the scratched or striated surface of each pebble and piece of stone he sees the record of a long and tedious journey; and from the nature of the material he knows from whence it was brought. Here is a fragment of granite, this of greenstone, this of

mica-slate, that of quartzite, all telling of an origin in regions farther North.

There is a pasture-field among the hills where the origin of streams is pleasingly exemplified in the birth of Mink Run. The slope is gradual and the quantity of water from the water-sheds at no time so great as to deface the verdant sod. A few springs add their perennial product to form the shallow thread of water which marks its course by the fresh green line of water-cress and other herbage at the base of the hill.

Here the little stream takes a turn and a sudden change now appears. The hill, whose western slope was gentle and clothed with verdure, is cut into a deep chasm on its northern face. A bit of forest has had time to grow and rot, how many times over it is hard to tell, since first the ice-sheet melted in the rays of the sun. An opposite hill of almost precipitous incline is lined with springs and swamps; further on is a forest.

The slender thread of water courses through a bed tortuous and deep. When the windows of heaven are opened and the clouds pour out their contents, this brook becomes a raging and turbid torrent, carrying all before it. From the steep riven hills the floods descend and through the valley surges a small river.

But with the cessation of the rain the waters subside and the turbid brook sinks back into its bed. Yet all the summer the springs continue to flow from the hillsides, feeding the stream, where the waters shallowly murmur to the stones or, leaping the rocks in cascades, sing loud and cheeringly, unmindful of drought.

Once in my wanderings, shortly after the subsidence of such a freshet, I came to a level tract of shining brown sands, through which ran the stream of water. This place I had heretofore avoided, after several attempts to find solid footing. But something of daring urged me to make one more trial.

It was the straight line in my progress; otherwise, either to right or left, a hill I must climb to find the sure pathway.

Would the sands bear me? The stream is an easy jump, so narrow is it and so peacefully it glides along.

One foot I ventured boldly, and in a moment the sand was up to my knee, with no sign of foundation for the foot. Instantly I threw myself back on the grassy bank and was safe. Had I escaped one of the quicksands of the bog?

How many there may be I never attempted to ascertain; but that there was another one near a path which I always traveled in these

swampy regions, I know, as it swallowed a ten-foot fence rail without the least difficulty when pushed in endwise.

All the common trees of the forest are here: the ash, walnut, hickory, oak, elm, and maple, each in its varieties, except the butternut, which I have not seen thus far in this vicinity. The fox-grape stretches its fertile stem from tree to tree above the stream. A red mulberry showers down its fruit in season. In one spot there is a group of young trees recently dead, their trunks clasped by a poison vine in flourishing health.

At this point another stream from hills farther north joins its waters to the first. The forest has been cleared, but along the banks the prickly ash, the lance-leaved buckthorn, the wild plum, and the wahoo still grow. The little shrub called New Jersey Tea (the leaves of which were used by the soldiers of the American Revolution as a substitute for that tea which was cast into the ocean, to furnish a beverage), also called the wild snowball, grows along the fences of the upland. The red-bud and the dogwood make the woods joyful in the spring.

All about our feet the ground is laughing in flowers. Violets, phlox, spring beauties, anemones, hepaticas, in spring adorn the sod.

On a rocky bank in June a bed of prairie wild onions is very pretty; here and there the star grass shines yellowly among the dead leaves.

At one point, beside a steep bank, a group of lizard's-tail droops slender white flower-spikes above the stream.

The blue-eyed grass rejoices in the damp and sunny openings; the loosestrifes in several varieties bear it company.

The monkey-flower wades out into the brook; the conobea lingers at the edge, her feet laved in the ripples.

The forget-me-not of the marshes, with golden eye bordered in blue; the turtle-head and hedge-hyssop, its neighbors; the Indian paint-brush of the damp meadows nearby; the dodder, twining its pale pink parasitic clusters among the clover, its orange threads and cymes in beds of mint, or its yellow, glomerate masses amid the coarse weeds and bushes and the tall stems of the sunflowers,—these are a few of the floral denizens of the bog and its borders and of the interlacing streams.

More rarely, on sunny slopes in a setting of the most fertile soil the papaw basks and ripens near the edge of the woods or on the banks of rivers. The green leaves turn to gold as the custard-apples ripen and lose their astrin-

gence in a mellow and rich pulp under the touch of advancing winter.

Speaking of the butternut reminds me of the hills of Muskingum, where, as a little girl, I gathered the nuts, where the beech tree flourished and the trailing arbutus gladdened my eyes. Does the stone foundation of the hills encourage the growth of these species? None of them I have found in Madison County, save as transplanted for ornamental purposes.

It was in a low Muskingum valley, near a stream on the edge of a woods, yet where the sun kissed them into ripeness, that in those childhood wanderings I first saw a colony of white blackberries. The fruit were not less than an inch long by less than half an inch in diameter, slightly amber in their whiteness when ripe, but not so rich in flavor as some, nor so acid as some blackberries. Perhaps they bore the same comparison to their black relative in flavor that the white mulberry does to the red.

Come, we will follow the windings of Mink Run, as it cuts the base of the next hill. Some colonies of the scouring rash have taken root down there. Mints of various kinds scent the air as we crush them under foot.

But soon our progress is impeded by up-

welling springs, and we are driven to seek higher ground. The purple flags have pre-empted this spot, coming close enough to solid land to bestow a bouquet for our gathering in the month of May.

Rushes and sedges of many beautiful kinds are here, and water-cress where the stream runs freely. Some day the town dweller will discover the secret of this pungent herb and add it to his regimen, as in the older hemisphere.

Should we follow our little stream farther down its course, until we come to a broad alluvial deposit, we will find it edged with the yellow pond-lily or spatterdock. The water-plantain, the cat-tail, the sagittaria, the bur-reed, will not be absent; the fog-fruit in the moist ditches, with many other plants which love the water. We may catch a glimpse of the great blue heron, extending like a slender line above the trees, as it disappears from view. The green heron flies noisily into the neighboring underbrush.

The kill-dee cries plaintively along the meadow lands. The water-wagtail may be seen in the recesses of the woods, where the stream steals among the flat stones and pebbles. He seems busy about something, a secret from all but himself.

In those portions of the swamp where the water has gathered in pools and the cat-tail, iris, and willow flourish, the red-winged blackbird builds her nest. It is a bulky mass of grass, sedge, reed, and other herbage, lined with the finest and softest grass to be found, hanging among the straggling bushes and reeds or resting in the crotch of a low willow. It is always concealed from view, but the loud protest, threatening and shrill, which is raised when one approaches, gives assurance that the visit is unwelcome. As the intruder withdraws, the satisfied birds utter the musical notes which gives them with some the name of "Tit-willow," with others, that of "Kongqueree."

The musk-rat is seen occasionally. The mink is found more rarely in these regions, but the name of the stream indicates that here was a favorite resort of the little creature whose beautiful fur has caused its decimation.

There is a ground-hog's hole in a black bank. The dark, heavy creature tumbles clumsily into his den at times when I have wandered too near, gathering the fragile fern or the violets or the blue-eyed grass. There is, at times, good reason to suspect the presence of the polecat in the neighborhood.

It is a region of much floral loveliness, this diversified hill-and-hollow of the moraine. The

columbo, comandra, or bastard toad-flax, many varieties of goldenrod, brauneria or purple cone-flower, the superb lily, as also the Canadense, are found mingling with the tall wild grasses and sedges, with the numerous varieties of the pea, aster, and sunflower families. The wild hyacinth luxuriates in the black soil of the shaded swamp.

In this wood huge white growths of the giant puff-ball, weighing several pounds, have been found in the autumn. Cut a slice from one of them and angel-food cake is suggested by the snowy, even surface. Fried in butter, broiled, or stewed, it is good eating. The mycologist finds this region full of rewards for the search, for here, besides several varieties of the puff-ball, are numerous varieties of the mushroom, polypore, coral fungi, tremella, etc. There are lichens of great beauty and many pleasing mosses awaiting scientific identification.

Here are a few families and genera, samples of the region's flora:

Gramineæ: Andropogon scoparius, A. furcatus; Chrysopogon avenaceus; Sorghum Halepense; Syntherisma sanguinalis; Syntherisma filiformis; Panicum crus-galli; P. agrostidiforme; P. Porterianum; P. macrocarpum; P. pubescens; P. proliferum; P. capillare, P. flexile, P. minus, P. rostratum, P. Variety capillare-campestris. Ixophorus verticillatus, I. glaucus, I. viridis, I. Italicus. Homalocenchrus Virginicus, H. oryzoides. Phalaris arundinacea,

Savastana odorata; Muhlenbergia Mexicana, M. sylvatica, M. tenuiflora, M. diffusa; Phleum pratense, Alopecurus geniculatus; Sporobolus vaginæflorus, S. heterolepis; Cinna arundinaceæ; Agrostis alba; Danthonia spicata; Spartina cynosurides; Ellusine Indica; Sieglingia seslerioides; Sieglingia stricta; Eragrostis capillaris, E. Frankii, E. Purshii, E. eragrostis, E. major, E. hypnoides; Dactylis glomerata; Poa annua, P. compressa, P. pratensis, P. flava, P. alsodes; Panicularia nervata, P. Americana, P. fluitans; Festuca elatior, F. nutans; Bromus inermis, B. ciliatus, B. pubescens, B. asper, B. tectorum, B. racemosus, B. sterilis, B. hordeaceus, B. secalinus, B. unioloides; Lolium perenne; Hordeum jubatum; Elymus Virginicus, E. Canadensis; Hystrix Hystrix.

Carex: C. Louisianica, C. lupulina, C. hystricina, C. squarrosa L, C. trichocarpa, C. Shortiana, C. lanuginosa, C. filiformis, C. stricta, C. costellata, C. triceps, C. Cariolíniana, C. gracillima, C. Davisii, C. grisea, C. glaucodea, C. pallescens, C. oligocarpa, C. Meadii, C. laxiflora, C. Pennsylvanica, C. varia, C. nigro-marginata, C. Willdenovii, C. Jamesii, C. conjuncta, C. stipata, C. gravida, C. vulpinoides, C. setacea, C. Sartwellii, C. rosea, Variety C. rosea, C. sparganioides, C. cephaloidea, C. cephalophora, C. Leavenworthii, C. stellulata, C. interior, C. strilis, C. arcta, C. siccata, C. Muskingumensis, C. scoparia, C. foenea, C. cristatella, C. straminea, C. alata, C. Bicknellii.

Juncaceæ; Juncus bufonius, J. tenuis, J. Vaseyi, J. Greenei, J. repens, J. nodosus, J. brachycephalus, J. Canadensis.

Cyperus: C. rivularis, C. rotundus, C. erythrorhizos, C. strigosus, C. refractus, C. ovularis.

Stenophyllus capillaris.

Scripus: S. Americanus, S. lacustris, S. atrovirens, S. lineatus.

Rynchospora capillacea.

Eleocharis: Eleocharis Robbinsii, E. palustris, E. tenuis, E. intermedia.

Triglochin palustris.

Solidago: S. caesia, S. flexicaulis, S. rugosa, S. patula, S. neglecta, S. juncea, S. serotina, S. Canadensis, S. nemoralis, S. Radula, S. rigida, S. Riddellii, S. Uliginosa.

Aster: A. macrophyllus, A. Shortii, A. azureus, A. cordifolius, A. Lowrieanus, A. Drummondii, A. alvearius, A. sagittifolius, A. phlogifolius, A. Novæ-Angliæ, A. puniceus, A. prenanthoides, A. laevis, A. junceus, A. longifolius, A. gracilis, A. dumosus, A. Tradescantii, A. ericoides, A. lateriflorus, A. lateriflorus diffusus, A. hirsuticaulis, A. lateriflorus horizontalis, A. vimineus, A. Tradescanti var, fragilis, A. ericoides var. villosus, A. cordiofolius var. incisus, A. Lowrieanus-Bicknellii, A. carmesinus.

Helianthus: H. scaberrimus, H. laevigatus, H. microcephalus, H. gigantea, H. grosse-serratus, H. divaricatus, H. decapetalus, H. tracheliifolius, H. strumosus, H. hirsutus, H. laetiflorus, H. tomentosus, H. tuberosus, etc.

One summer day, wandering through the wood above the stream, I saw a peculiar white growth bursting through the humus at the root of a tall tree. No vegetation was around it, for what with the meager light through the thick foliage and the washing away of storms on the prominent point of land, grass had but little encouragement.

With the point of the trowel the growth was carefully raised and examined. It consisted of a cluster of white, drooping bells, each on a straight, white, wax-like stalk. Small, alternate ear-like leaves or bracts were pressed the whole length of the glistening stem. It was a flower,

perfect and regular, but new to me; and yet, from botanical mention, I was not unprepared to find it.

Between joy over its discovery, and astonishment at its characteristics, a variety of feelings awakened. Not a vestige of green throughout! Cold, pallid, like the dead! What uncanny thing of the dark earth is this?

How uniform is the track in which human thought runs: for I found, in tracing the Indian Pipe in the botany, that "corpse-flower," "ice-flower," "ghost-flower," are its common names. Although termed a saprophyte or humus flower, I found its roots imbedded in a nucleus of what appeared to be grains of sand. Nor did it become soft in decay, but held its solidity to the last. But from white it turned black throughout. A few days afterward I looked further in the same locality, and found several more clusters which had grown to maturity, the scapes standing out of the ground to a height of three or four inches. In this variety of the Indian pipe but one flower terminates a scape.

The specimens which attract attention are not always confined to the vegetable kingdom. There is an interesting old party who frequents the most sequestered woods in search of ginseng, the roots of which he sells profitably to

the druggist and Chinese laundryman. He knows its haunts and that of certain other medicinal herbs. He is known as "Doc." Probably he practices the healing art among a choice circle of his humble friends. It is as the vender of hazelnuts and 'seng that he stands among my acquaintance.

He is somewhat below the average in height, lean and wrinkled. His garments are faded to the color of the dust, yet he has an air of self-respect that wins confidence.

Driving out to the farm one morning, I passed him on the road, then stopped and waited till he caught up.

"Good day. Do you want a lift to rest your tired feet?"

"Thank y', I don't care ef I do," and he beamed a watery smile.

"And how is the ginseng crop coming on? Do you find much?"

"Not any more, I don't. Hev' to walk miles and miles 'fore I find 'nuff to make it wu'th while to go to the store. It 's gittin' mighty skeerce."

"Do you find any other plants that are good in doctoring?"

"Yes 'm. The's golden seal, an' spik, an' sa'saparilla, an' a hull passel o' truck. But I tell ye what—there ain't nothin' comes up to

burdock root for a gineral all-around tonic an' blood medicine! Yes, ma'am! It 's the finest thing on the whole skedgle. Burdock!—an' take the roots, spring or fall, an' make yerself a good bottle of bitters—the finest thing on the skedgle!"

"There 's plenty of it all about here, too."

"Why, ther 's nary a thing that grows but has its uses, ef ye jest knowd it. Here 's the road where I turns off, an' thank ye kindly fur the lift."

My errand that day was to a tenant who lived in a little frame house on the top of a hill. The gate from the road stood open and I crossed the shaky wooden planks spanning Mink Run. At first the ascent was gradual. To the left the fence was covered with wild grape vines and the green bunches hung in profusion under the sheltering leaves.

As the road ascended, on either hand gullies in which lay great stones, called by some "nigger-heads," rendered the progress difficult. The horse tugged, jerking the vehicle about in a most disagreeable way over the irregularities. But at length we reached the top.

I would n't want to make that ascent frequently. If I lived on the top of such a hill I would be tempted to parodize the poet:

"Good-bye, proud world, I will stay at home."

Nor would I plough up the thin soil of such steep hills, to have it washed away in the rains. Fruit trees flourish in localities of this sort, and orchard grass will bind the sands, while furnishing a luxuriant growth of herbage. Gather the stones, which ill-advised ploughing has brought to the top, and cast them into the deep gullies on the hillsides; then coax a coat of grass over the poor, denuded surface of the hill. A few years of good crops will never compensate for the stony desert which results from continued ploughing.

The tenant had something to tell of a heifer which had been "buckeyed." The animal had been experimenting with foodstuffs, evidently, and had eaten too liberally of the Ohio buckeye, which grows plentifully along the slopes of the hills. At least this was his diagnosis of the ailment which sent the beast moping to the shade of the woods, where it remained, without appetite, for a number of days, but finally recovered.

Returning, plodding steadily along on the side of the road is a woman. She is short and broad, dressed in a clean, faded gown of calico which once was pink. It is carefully starched, and sits out in stiff lines about her stout figure. A gingham sunbonnet discreetly shades her

eyes. On her arm she carries a white wicker basket with a lid.

I recognize her as the housekeeper of a wealthy old bachelor land-owner in the neighborhood. Doubtless she counts on a lift in some one's vehicle to take her into town, so I decide to be her good providence.

"Good day. Do n't you want to ride? Going into town, I suppose?"

"Thank ye. Do n't keer 'f I do. This yere basket hain't so orful light. It 's eggs. Takin' 'em inter town to sell 'em. An' I reckon on payin' my doctor bill, too. My! It do seem good to be around oncet again."

"Been sick?" She is so fat and rosy, it is hard to associate her with a sick-bed. She is still breathing laboredly after the exertion of climbing in. She takes time to recover her proper articulation.

"My shoulder an' ribs. Hain't sure as any bones was broke, but I got all pounded an' sore. It were a narrer escape."

"How did it happen?"

"Hain't you heerd?" Her voice had a note of shrill astonishment. "Well, 't was this-a-way: I was a-takin' a short cut acrost the field, fur I wus in a hurry an' never thought o' noticin' nothink, when the old man run me an' knocked me down. I had clear forgot the old man, I had."

"He run you!"

"Yes; an' I run jest as hard ez I could to git away, but jest as I clumb the fence he got there an' knocked me down."

"Knocked you down! What did he do that for? What harm was there in taking a short cut across his precious old field? I never!! What with their barbed wire fences and hedges, we have to keep on the dusty roads more and more!" Difficulties I had met in pursuing botanical research here rose to remembrance, and discontents over fences aroused my sympathy for the old woman's wrongs. "But to run you down! and knock you off the fence!—that 's a new one. When did he take to carrying on like that?"

"Oh, ye know," extenuatingly, which puzzled me, "ez he grows older he gits more pernickety. He hain't never been so orful gentle."

"Why do n't they shut him up, or send him to a sanatorium. He needs treatment. There 's money enough and to spare in all that land that might be used to bring him around again so he 'd act right."

"Huh!" Did she doubt my advice? It seemed so. "Huh! They all act that-a-way now an' then, ye know. An' they do shut him up in the stable now an' then, but I do n't see ez it betters him much. It aggerwates him, I 'm thinkin'."

"The stable! That 's no place. There are sanatoriums for such cases."

She seemed more than ever doubtful of me. But she resumed her story:

"After he knocked me onto the ground the first time I was that skeert! I dassent stir for a bit, an' then I knowed I 'd have to try agin to git acrost. So I riz up an' started to climb the fence agin. An' with that he knocked me off it the second time. I reckon he 'd about killed me then an' there, only some men as wuz workin' in the next field heard me a-screamin'." She chuckled a little at the recollection, and I remember thinking her mirth ill-timed, considering the indignity—"for I jest screamed fur all was out. An' they shouted at him an' run with big sticks an' pitchforks in their hands an' chased him off."

"But why do you live with him?" I asked, sternly. For though I am a believer in long suffering and mutual forbearance in family life, I firmly draw the line at assault and battery.

"Livin' with him?" She, too, began to show signs of irascibility with my stupidity. "I hain't a-livin' with him!"

"Are you not his housekeeper?"

"Oh," she said, "I hain't a-talkin' about *him*. I was a-talkin' about the gentleman cow;"

—in a very sepulchral whisper, suggestive of the most careful propriety—"ye did n't rightly understand."

Which shows how ignorant one can be of the rural nomenclature of the domestic animals.

After my companion had recovered from the shock necessarily received from the discovery of such ignorance, she proceeded to sound me on the news topics of the county at large.

"I hear tell there 's a new religion over to Sedalia?"

"Ah! Indeed? I had n't heard of it before. What do they call it?"

" 'The Holy Rollers' is the name I hearn."

"I have heard of the 'Holy Jumpers'—though not in this county—and I 've even seen people who saw some 'holy jumping,' but 'Rollers'—do they roll?"

"I reckon; 'specially ef ther 's a hill, it 's easier. One o' them 'Rollers' at Sedalia rolled right down the road—it 's on a hill—to the church door. Wisht I could a seen him!"

"Perhaps you may if you will go there before it 's time for his rolling and watch for him."

"I dunno. They say lots o' folks from the country did drive in a'rly to Sedalia and waited to see him, but he did n't. They ses it's jest accordin' as the spirit moves him that he

takes to rollin'. An' them ere hills at Sedalia is like the ones back aroun' your farm, mighty handy ef ye got any rollin' to do. Hain't it awful!''

The ''awfulness'' seemed to affect the old lady with undisguised mirth; for, while incidents of this nature may not add to the gayety of nations, it is not to be denied that they greatly aid the hilarity of monotonous country places.

Another use for the kames. Sedalia is in the heart of the kames of the terminal moraine a dozen miles to the south.

''Tom Weir 's gone into the concrete business,'' she resumed.

''Has he?'' I was about to say, ''Who is he?'' when I recalled the conversation heard some time before in regard to his work among the hills.

''Yes, I reckon he has all he kin do puttin' in floors, walks, cellars, an' even houses, all 'roun' through the country.''

''That's good.''

''Reckon ye 've been to see his mother.''

''Not yet; but I must go some day. It seems the days are never long enough for all I would like to do. But I will call on Mrs. Wier very soon.''

''Times ye 'r trapesin' over them hills after

weeds, ye might run back to the other road an' make her a visit.''

Lost in doubt as to just what she meant by her reference to the botanizing trips which took up most of my spare time in the country, we arrived in town and she signified her wish to alight.

A few days later, as I made my way toward the road out of a thick tangle of poison ivy and tick-trefoil (of which latter I had been trying to secure a good specimen—a difficult task), I came face to face with a couple of pedestrians emerging from behind a hill, going in the same direction.

They were a woman dressed in black and a man whom I at once recognized as a noted scholar and professor of geology in a leading university. I had met him in the city a few months before.

I was very glad indeed to see the professor, and told him so.

''I suppose,'' said he, ''you know your neighbor, Mrs. Wier?''

So I had to explain to Mrs. Wier, whom I was also very glad to meet, that I had been planning to call on her for a long time, but somehow the time has a way of slipping by and one has never half enough of it.

''And, Mrs. Wier, there is a fascination

about these hills and swamps which takes possession of me when once I get among them, so that I find it impossible to tear myself away until the last minute, when I look so disreputably frowsy that the only refuge is home, to which I hurry. Have you discovered any charm in their proximity yet?"

"A great deal; and my son has shared his study of their geological features with me, so that I have thought of them in that way somewhat."

"Professor, do you recall what we were speaking about—the iceberg drift and Dr. Newberry's theory in regard to this region?"

"Ah! about icebergs carrying the boulders of huge size? The views of Newberry given forty years ago in regard to the ice period are not accepted now in so far as they involve the submergence of any part of central and southern Ohio, or involve iceberg action. The glaciation of Ohio was by a continental ice-sheet alone, though during the retreat of the ice large temperate lakes formed against the ice front in the Lake Erie region, and the margins of those water bodies are shown by the 'ridges,' etc., in northern Ohio."

"Mrs. Wier," said I, "take time to consider the word 'ice-sheet.' Can you imagine such a thing a mile or two miles in depth?"

"Three miles is considered by one authority as a moderate estimate. A possible eighteen for some regions is hinted at. I am more than delighted to hear the Professor's theories in regard to this portion of the country."

"In this part of Ohio," proceeded the Professor, "there were two ice invasions—that of the Illinoisan ice-sheet; and the last invasion, that of the Wisconsin drift. Between the two was an inter-glacial period in which the ice-sheet melted back probably from all of Ohio and southern Canada, and possibly disappeared from North America wholly—no one knows."

"I am not altogether ignorant of what you are speaking, Professor," said Mrs. Wier; "but there are several other 'invasions' mentioned in my son's text-books, into which I glance as I find time."

"The evidence for the three earlier ice-advances is not found in Ohio, but farther west. If the earlier sheets invaded Ohio, the later advances (Illinoisan and Wisconsin) destroyed their deposits and prevented our knowing of them."

As the Professor concluded we came to the end of the private road upon which we had been walking. A gate opened on the highway, and here I should leave them, I thought regretfully, to find my way to the next interurban

stopping-place, half a mile or more away. I had come out on the car that day.

"We are to have a new stop at this place—or not far off," said Mrs. Wier. "Have you ever been at my son's workshop? I guess he won't mind you, if you care to come with us. He has some special things to see to to-day that were to keep him there; but usually you can hardly tell where to find him of late, his work is so scattered around through the country. It grows very rapidly."

The invitation was accepted promptly and gratefully. The path led around an embankment above a small stream, a tributary of Mink Run, which became a torrent at times of freshet, and through a thick grove of willows which hid from the road the sheds and buildings of "young Wier's concrete plant," as it was now spoken of through the country.

Blonde, well built, five-feet-ten or more in height, the proprietor of the plant was found in the office, or weather-proof inner room, arranging on a shelf sundry blocks which had just been taken from moulds. He was delighted with the visit of his former instructor, and the Professor was soon busy inspecting the products of the young man's skill, as were we all.

They were representations of plant, flower, fruit, in fine, smooth sand. Some of them were

conventional designs common to architecture. They were in natural gray, red, and pale green colors.

"Experimenting, Professor." The young man was somewhat apologetic, yet a tone of satisfaction indicated that he was pleased with the result.

But my own affairs called upon me to be on my way. Congratulating Mr. Wier upon the success of his artistic designs and the promising field which lay before him for their use, I gathered up my portfolio and took leave of my new friends.

What is more interesting than the road are the people who travel it, even as the houses of the inhabitants predicate a deeper concern than the terminal moraine and the adjacent swamps and fields. All the changes hinted at by geological discoveries may have preceded the advent of man upon the earth.

How and where the human race first appeared, whether one or several varieties, or whether it is a continuation and higher development of the animal kingdom, through the ages of invertebrates, fishes, reptiles, birds and mammalia, there is no satisfactory proof. Scientists present hypotheses on the subject more or less satisfactory—usually less.

But this we conclusively know by geological discovery, that from a primitive life in caves and huts, aided first by implements of bone and stone, to the present complexity of knowledge, arts, science, inventions, and luxurious living, man has progressed. There has been no physical alteration observed through our known history of him greater than may be accounted for on the basis of civilization and climate or of intellectual and psychic development or degeneration.

An interesting and, as yet, unanswered question is: Did man exist previous to the glacial epoch? In the glacial deposits rude paleolithic implements of argillite, flint, chert, quartz, etc., are not infrequently found. It will be well for the public to be on the alert to save for scientific examination by experts in ethnology everything of this kind found in the earth.

In the month of November, 1911, at Waterworks Park (London, Ohio), a number—ten or more—chert arrow-heads were discovered by well-diggers at a depth of 80 feet, on a bed of blue clay mixed with pebbles. It was not until several months afterward that I heard of this very interesting "find," when all but two of the arrow-heads had been carried off by the workmen, who were from Washington C. H. It would be now difficult and uncertain to trace them.

Leaving the strip of bog which has furnished a whole season's entertainment, we keep along the banks of the little stream until the foothills are reached. Amid grass and sedge, seeped in the cold water of a spring emerging from the gently sloping land, a bed of *Parnassia Caroliniana* was discovered one September evening. Little did I guess the treasure I had found and the moments of joy which the future held for me through this pure blossom!

Parnassia belongs to the Saxifragaceae Family. A scape from eight to twenty-four inches in length supports a terminal white flower, or sometimes yellow. In our grassy, hillside spring the flowers are white, with minute markings, or tiny flecks, of green, like the shadows of lines in a bit of alabaster. A single sessile leaf clasps the stem below the middle.

A cluster of roundish, petioled leaves rises at the base. Alternate with the five broadly ovate, marcescent petals are five stamens, and at the base of each petal a cluster of three staminoidia, or imperfect stamens. In another variety there are from nine to fifteen staminoidia.

Here is an illustration of the economy of plant development: Five stamens proving sufficient to fertilize the numerous ovules of the capsule, the remaining ones cease to perform

their office if, in the mysterious order of nature, they were ever fully developed. Like the vermiform appendix in the human anatomy, they are of no use, and one can only speculate as to why they are there.

The plant receives its name from the Mount, favored by the muses and the gods, Parnassus; the name being conferred by Dioscorides, a Greek physician, in the first or second century of the Christian era.

One lovely day in October I gave a luncheon in honor of one of the fair daughters of the neighborhood whose marriage was soon to be solemnized. A large bowl of fringed gentians, from the swamp in the cornfield, occupied the center of the table, and each guest received a few blossoms of this plant. To the bride was given a small bouquet of Grass of Parnassus, all that the hillside bog had vouchsafed to produce.

It was the first time that either flower had been seen by any of the twelve guests assembled, and their pleasure and interest may be imagined.

"When we were at Sulphur Springs, Virginia," said one of them, "a young man at the hotel, who was a botanist, spent a lot of his time looking for this flower, Grass of Parnassus. He said that it is very rare, and that he had been told it grew in the neighborhood of the

Springs. I never heard that he found it, though."

PERHAPS no American flower has been more sung of by the poets and generally mentioned with interest than the Fringed Gentian. Coming late in the year, when the floral ranks are growing thin, and hiding in swampy ground away from the trodden haunts of man, this beautiful blossom must be sought with care. In the early morning, too—

". . . when the quiet light
Succeeds the clear and frosty night,"

must her lover seek, else will the dainty fringed petals have closed and the cup of cerulean blue be hidden from sight. Yet on a cool, dark day, when the sun failed to shine, I have known the flower to remain open the whole day.

Long had I sought for it, but always to find that the blue which had beckoned me was that of the lobelia—blue cardinal flower. One day a friend described a flower, new to her, which had been brought from Robert's Mill, or the Fish Hatchery, she thought; blue and with a fringe on the petals.

A fringe on the petals? And blue? It must be! There is no other.

So at once the search began; but that night we drove back to town without having found it. A few weeks afterward the search was resumed and the flower found on the grounds of the Fish Hatchery, the true Fringed Gentian.

Then was there much sacrificing at the floral shrine, of quoting Bryant and Helen Hunt Jackson, the prose of Miss Sedgwick, also, in "The Boy of Mount Righi." There were drives in the crisp, frosty mornings, for it was in November, the weather mild Indian summer, when it was first found. Since then I have found it plentifully in bloom in September, when not a suspicion of frost could be detected on the warm, bright day.

Getting its name from King Gentius of Illyria, this lovely flower holds regal court, also, in my strip of bog, the bouquets of "ribbon" having long since passed through some transformations since I first beheld it. Riddell's and the Bog Golden Rod, yellow, with their plumes, now share the setting of the loom with the hues of this queen:

> "Blue, blue, as if the sky let fall
> A flower from its cerulean wall."

A black soil, from which all mineral matter —or nearly—has been leached, is the habitat of the fringed gentian. In grassy tufts it rises

above the hidden moisture, which must have means of drainage, never lying in pools about the slender, white roots of the plant, so far as my observation has gone.

A year or two after the finding of the fringed gentian, accompanied by a friend I visited the Fish Hatchery. A little boy of four volunteered to be our guide, the son of the family in charge. Previous to this, considerable effort had here been made to establish the pheasant as a game bird in Ohio, but this had now been abandoned as impracticable, and only one golden pheasant remained at the hatchery. This bird the child invited us to see.

Dear little Charlie! It is a question which we marveled at the more—the fine coloring of the handsome bird, or the intelligence of the child, lisping facts for our information and making himself our genial entertainer.

Next we visited the slope above the pond, where the fringed gentian had been found. There was not much of it in evidence.

"Ladies often drive out here and ask to see this flower," said Charlie.

"You must tell them not to pull it up by the roots; they are so small and white and frail, and come up so easily, if one is not careful."

The child listened attentively.

"And tell them that it will not bear trans-

planting; that it has been tried, but no one ever succeeded in making it grow. It is said to be the one plant which has refused to become a resident of Europe. Tell the men who work in the ponds not to throw it away when they have to dig it up, but to replant it; it is such a precious and beautiful flower, and you will be so glad to have it here at the Hatchery."

"Yes," said Charlie, "I 'll tell 'em."

* * * * * * * * * *

What a way time has of slipping by! It was four or five years more before I visited the Hatchery again. We were down at the ponds and I had been explaining to my companion how the young are reared in the different divisions of the numerous ponds and, when old enough, shipped to different parts of the State to be placed in bodies of water as desired. Presently a workman took out a shovelful of the ill-smelling, slimy, green water weed, which is so troublesome in quiet waters, for my inspection, when I became aware of a big boy walking in our company and, by his side, a very contented goose.

He volunteered to get me a better specimen of the water-weed. He told us about his goose, which had come to meet him the moment school was out and he at home. It was a wild goose which had been captured on the pond a few

years before. The goose would let no one touch him but the child, and would bite if a stranger attempted to take liberties. It was a sight to see the bird waddle along fondly at the side of the boy, expressing its satisfaction in some low gabble.

After a while the boy said:

"It was you who told me about the gentian—the fringed gentian, was n't it?"

I did not understand at first, but in a moment the five years slipped away.

"Are you that little boy who showed us the golden pheasant? Now truly, are you Charlie? You have grown so large that I would hardly think it possible."

Yes, it was Charlie; the same inquiring mind and genial host as of other days; one to make us love childhood and look for large possibilities in mature years. He had told his parents about the flower, and under their care it was multiplying and flourishing in different parts of the grounds.

Whoever visits the fish hatchery near London, Ohio, in the autumn, may have the added pleasure of seeing this lovely flower in one of its native haunts.

Once upon a time I found a dear little three-year-old child playing beside a bank of tall, luxuriant ferns. "I 's calling on Lady Moss-Green," she explained. When I had taken myself off, she proceeded with her prattling confidences intended only for the lady of the greenwood.

Even so in the childhood of the race we peopled the trees with Dryads and Hamadryads.

"Still
Doth the old instinct bring back the old names."

Have you ever met Lady Moss-Green? A most charming hostess, ever ready to extend a welcoming hand and the entire hospitality of her establishment. No excuses are made on your arrival for possible unreadiness, as no such condition ever exists within her borders. Winter, summer, autumn, spring, it is all the same; for even when her summer fripperies are laid aside you are absorbed in admiration of the austere beauty of her furnishings. The winter trees are fascinating.

Last June it was that I met *Geranium maculatum* in her parlor, holding her seed vessels aloft in a graceful cluster from the point of a prolonged receptacle. Her five one-seeded pods extended from the tips of their slender, curving

styles. What an admirable pattern for an electrolier! Not far away was *Erodium,* a near relation, who had given a few extra twists to the styles, elaborating the pattern.

Indeed, it is common report that the best architects and artists, to say nothing of decoraters of interiors, are in the habit of frequenting the receptions of Lady Moss-Green for the express purpose of getting ideas for new styles.

I know not how it is with the mechanic, but of a truth *Phryma leptostachya* is a wonder to me. At first I said, "She is an arrant coquette; see how she draws her treasures to her side, holding them there till she chooses to dispense them; then, her purpose ripe, she flings them on the winds, holding out her empty hands and laughing in your face."

Or, is she an economist, appearing to withdraw her stores only that she may the more widely dispense them, seeding for harvest?

Certainly she is an example of a natural sling; consider for a moment the unsolved motive force in that little flower.

The family of *Cruciferae* is well represented in the estate of my Lady, and its members are worthy of the favor with which man regards them. How bountiful their stores of pungent seeds! And here is one of the *Capparidaceae* family, *Cleome pungens,* a brilliant, gracious

and friendly guest. Decked in her pretty lavendar gown, all fringes and furbelows, she attracts to her side. How generously she extends hospitality to the honey bee, and her hands are full of gifts! Take what she gives you; it is wholesome and hearty cheer. Like wit, it will season your simple repast and give zest to the daily monotony.

Sauntering through the woodland one afternoon in May, in the dense shade at the root of a tree some little fairy people, four or five inches high, swayed gracefully in a gentle breeze, nodding to each other.

Pale, fragile-looking little things, they held their own bravely when gathered and carried home. *Thalesia uniflora,* by name—how gracefully suggestive! Far prettier than the common *cancer-root* by which some know them, or broom-rape, still another. Unfortunately for the family, some members of it are very much disliked by the agriculturists, as they quarter themselves on the clover. In fact, the whole family, *Orobanchaceae,* is parasitic. This was my first introduction to any of its members.

Another day, later in the season, and in the same locality, what purple shadow under trailing leaves beckons to discovery? The *Virginia Snake-root,* a near relation to the *Dutchman's Pipe.* And so it goes. Rarely do we spend a

portion of our time with Lady Moss-Green that she does not bestow a precious souvenir to mark the occasion.

The little child who was with me, closer to the ground than I, saw yet more.

"Look! Look!" she said, in a voice where fear predominated.

It was a land-tortoise, its head protruded, hissing industriously. Very snakelike in appearance, its slow gait precluded fear. With a compliment to his pretty, crimson-tinted carapace, we hurried on, doubtless much to the peace of his lordship.

"Do you ever meet any snakes when you are botanizing?"

I had invited a friend to be my companion on one of my trips to the woods, and we were bowling along the smooth road, the fertile fields on either hand, the soft breeze gently fanning us as we progressed toward our destination.

"Once," I answered, "as I stole up to a little stream which issued from a spring in the hillside, I looked across the fence and saw a tiny water-snake disporting in the crystal fluid."

"I don't call that anything," she interrupted, for she loved to talk, and had bigger stories than mine to relate. "Dear me! I knew

a young lady in Virginia who went to spend a night with a friend in the country. It was a fine old mansion, with the trees drooping over the windows, so that the sun merely filtered through and never shone in quite hot at any time of day."

"Very bad for the health. Why did they not cut some of them down?"

"When she went to her bed-room the first night," continued my friend, paying no attention to the interruption, "she stood in front of the mirror, and by the dim candle light contemplated her reflection, wondering how many in the early pioneer days had gazed into its dim and faded depths. In an absent sort of way she began to remove her collar and ribbons and then her hairpins, which she was about to stick into what she took for a holder or some sort of a pin-cushion, when she fancied that she saw a motion quiver through its rounded coils, for it was of circular shape. Bringing the candle closer to it, she examined it attentively. Imagine her horror when she discovered it to be a huge snake whose nap on the bureau she had disturbed. Almost paralyzed with fright, she stood rooted to the spot for a time, but finally managed to go to her door and yell. Her friends came to the rescue and killed the poor reptile, whose curiosity had brought him into

this unfriendly region. A neighboring window had proved a tempting opening, as it was kept slightly lowered at the top for ventilation throughout the summer.

"Still somewhat shaken by her experience, she completed her toilet for retiring and was soon comfortably established in bed. Presently she heard a dull thud on the floor, as of something falling or jumping from the window. This time she did not go to the door, but yelled lustily from her bed. Her friends came quickly to see what had befallen her. On hearing her story they searched the floor and found under the bureau a huge snake, evidently the mate of the one which had met its end while posing as a pin-cushion. It was speedily despatched."

"And the poor girl? Did she get any sleep that night?"

"I can not say. But do you never see any large snakes? That tiny one was not worth mentioning. I have heard you talk of swamps; have you seen no snakes?"

"The farm where we are going this afternoon is said to be just swarming with snakes in the swamps. The man who ploughed the land tells that one not less than five feet long chased him, but he killed it. The farmer's wife saw one come up out of the swamp to steal her chickens; but her husband happened to be handy and he

despatched it. You will see it hanging on a branch of the pear tree as we pass the house. It is not less than four or five feet long."

"For the land's sake! I 'm afraid to go! Do n't go botanizing this afternoon. We 'll drive gently along this lovely road without stopping anywhere."

"I had not finished about the blacksnakes at the farm. Last autumn the man says that a big snake chased the horse from the water when it came to get a drink. And the horse ran off good and fast, too."

"I like to hear snake stories when I am not likely to meet any snakes. I think the wild places in the country are fearful, but as we are not in any of them, tell me about snakes you have seen. Go ahead and yarn away."

"What I will tell you are not yarns, but simple truth. Once, when I was little, I was running along a dusty road in the country in the twilight of a hot August evening. The shadows of night falling around, I fell right over a large snake which had come out into the road, probably to catch toads or something. It wriggled away into the long grass by the roadside. A little further on, another snake fled from his lounging-place in the dust of the road and disappeared in the grass. I was pretty frightened, but probably no more so than the snakes."

"I should think. Well, go ahead with your snake stories."

"Once, when I was about twelve years old, I went blackberrying with a party of young people. I was running on ahead through the long grass on the side of a hill. Suddenly I was brought to bay by a snake that seemed to stand on end and hiss z-z-z-z in my very face. I yelled with all my might, and the snake disappeared in the grass. I am not sure which was frightened the more, the snake or I."

"That was sensational enough for any one. Go on."

"Once a friend and I walked along a hill above a low, swampy land. It was mid-summer and the day was hot. As we mounted to the highest point she told me to stop and look below. The tall rushes and grass waved, though no wind blew, and soon forth issued a big black snake, I am afraid to say how long or thick. I should have been more terrified than I was, but the snake was headed away from us, and it went on down the valley and disappeared into a thick underbrush."

"And is that all? I 'm not tired listening."

"No? Well, once when I had just passed my 'teens and was beginning to feel impressed with the flood of years, I was roaming through a forest, without a thought of danger. I saw a

fallen tree which I thought would be nice to clamber on as I used to do in childhood. Suddenly I was stopped by seeing a peculiar shining light at some distance in front of me. I gazed at it in fascination, speculating as to what it might be. Was it the reflection of the sun in a drop of dew, making that brilliant diamond light? Was it the eye of a serpent, unblinkingly drawing me to destruction? Then it came to my remembrance that I had been warned to avoid that very piece of woods on account of the rattlesnakes, copperheads, and other deadly serpents which were reputed to be found in it. And only the day before I had killed a young adder on the road near by. Then I fled. I can never forget the terror I experienced. And whether it was from imagination or some natural enemy I can not say. I only know that the fear was real enough. Now I think I have given you a full account of all my snake experiences."

"But that was long ago. Surely you must see them in your trips for flowers; you go a great deal, and into all kinds of places."

"One experience, bordering on psychological, I can relate. Last summer an impression came to me that a snake was on our premises. It was not merely an imagination, because it would not be dismissed as the figments of the brain may be. Besides, there is so much shrub-

bery and weeds growing by the fences, a snake might easily enjoy life in our garden.

"One very warm day in May of this year the snake was discovered—a young and harmless house-snake which had adopted us. It was fourteen inches in length and not much larger than a lead pencil in girth. Alas! for the general prejudice against snakes, he was despatched."

"Of course. The right thing to do. But, as I was saying, in your search for flowers in the woods and long grass and weeds, surely there are snakes?"

"Yes; but I never think of them. I am not looking for them, or I presume I could see some. At this farm, where we will spend a few hours, I have been many times. I have ranged through its swamps, wandered along its stream, and climbed its hills. Every inch of its woods seems familiar to me, and once a ground-hog tumbled out of my way into its hole; but a snake I have not seen. I know that the stories told of its numerous snakes must be true. Here we are."

As we passed down the lane leading to the house, lying upon a bank was the long, dark body of the snake the ploughman had killed. Further on, at the back of the house, hung the limp length of a five-foot snake, as a warning to all chicken-stealing ophidians. My companion groaned with disgust and fear.

I drove along the meadow road overlooking the stream, now shallow and silvery, but which in times of freshet went tearing all before it. We reached the woods.

"It looks like the very headquarters of snakedom off through there," she said, pointing to the course of the brook through fallen, mouldering tree trunks, under the shelving banks and slender, graceful forest trees festooned with grapevines which bordered its meandering course, to the glimpse in the distance of open swamp and glade. I descended and tied the horse to a fence.

"I have a book here for you to read while I am gone," and I brought forth from its hiding-place a volume of short stories. "I know you will become so interested in this that you will forget all about snakes. Whereas, if you went with me, you would be so afraid, that all the snakes in the region roundabout would come out to gloat over you. I fear their greeting would be like that the ploughman received. As for me, I shall be so interested in seeking the specimens for which I have come that I shall not think of the poor creatures at all.

"A few years ago a party of scientists from the State University went to Guatemala. They saw scarcely a reptile, and those of a harmless nature. One of the men wished to find some

rattlesnakes, so the whole party took a special hunt one day and collected seven. Previous to that they had not seen a single one. If this happened in the tropics, don't you think we need not worry about snakes here?"

It is not always snakes which prove to be the *bete noir* of the woman botanist. It is much more likely to be tramps. The locality is indeed sequestered from the haunts of man where the uppermost thoughts of the lonely female herbalist are not mixed with fears of meeting some lawless member of the vagabond class.

It was a hot day in August. Any other woman would have been taking an afternoon nap, but the spirit moved the woman-botanist to go to a certain locality in the country in search of certain specimens which were due to have reached the time of seed. The woods extended for about half a mile along the road.

"I will enter at this end of the woods," said she to the boy who was driving, "and I will walk through to the other end, where you may wait for me."

So saying, she crossed the fence and disappeared in the thick undergrowth, while the boy and the phaeton also disappeared down the road.

She found some ferns and sedges which had matured; she paused to hear a bird sing: "Teacher! Teacher! Teacher!" You do not hear that bird sing in town. There were pretty views to see between the giant oaks where a clearing had been made. It was all so sylvan and refreshing that for once the thought of her solitude being intruded upon by human being was entirely forgotten.

As she advanced, the clearing became wider, the trees fewer. Here is a path visible in the greensward. And what is this? A man lying face downward in the shade of a great oak tree. His wide straw hat lay partly over his head, a bright tin bucket by his side. She was out in the open—there was no friendly shrub, into whose shade she might quietly retire, close at hand. She stood at bay, breathless, surprised. She stared at the prostrate figure. Not a movement revealed that he had heard her approach. Perhaps he had fallen in a faint and she should seek for assistance? What was the trouble with the man?

One thing she decided to do—she would steal out to the road and make her escape. The path led to the highway, and just across was a house. She decided that she would not apprise the people that a man lay in the woods, for it was most likely that he was taking a noonday siesta like normal mortals.

A little out of sorts with her own cowardice (or caution, was it?), she walked along the road, noting that, further on, a herd of cows fed by the wayside. Something unusual about a plant inside the fence attracted her attention. She climbed over and dug it up. It certainly was unlike anything in her collection, but its slender spikes of irregular purplish flowers had been partly cropped off. She decided to remain inside the fence, on a well-worn and convenient path, and search for a more complete specimen. By so doing she might also avoid that drove of cows, although a second thought assured her that they were too much interested in the grass to pay any attention to her.

Setting out on her quest, she had not walked a dozen steps when she saw lying in the grass, immediately in front of her, a gigantic man, face downward, straw hat shading from the flies, and a general air of repose.

"This woods is just fairly swarming with men lying in the grass! I 'll have to give it up!" So, taking the road once more, she braved the presence of the herd of cows as a lesser evil, and sought her driver, whom she found at the far end of the woods, also extended upon the grass in shade of the trees.

She afterward learned that the men were most harmless persons and that they were the custodians of the herd of Jerseys.

But as she turns over her herbarium, the mutilated specimen of *Phryma leptostachya* recalls one of her most sensational experiences.

This plant, the only child in the family of Phrymaceae, has a peculiarity which bestows upon it the name of Lop-seed. The calyx, after flowering, is abruptly reflexed against the stem. When the seeds have ripened they are thrown out by a sudden upward motion of the receptacle, which now becomes horizontal in position.

It was in this locality that a cucumber tree was observed. It had been spared by the owner when the woods were cleared away, and now stood alone in the middle of a large field sloping toward the southwest. Its bright, rosy cones of seeds among its dark green leaves were shaped like small cucumbers, giving this member of the magnolia family its common name.

In the front yard of the residence of this farmer were a number of persimmon trees to which the owner had on a former occasion called attention. There was one variety which ripened without the aid of frost and was, in September, ready for eating and quite free from astringence.

As THE heat of summer gradually dries up the higher portion of the swamp—the infrequent rains failing to replenish the hollows—the range for tramps of investigation increases. With the approach of September the ripening elderberries call for gathering and housewifely preserving.

The residents of the cities are growing appreciative of this berry and may often be seen bringing home a basketful gathered in fence-corners or near railways beyond the suburbs. Spare the elderberry in the waste places when grubbing out the unwelcome intruders from your tidy farms.

Do you know the value of this fruit, and how to subdue its uninviting flavor and bring into favor its good qualities by rendering it palatable?

The pioneer housewife made most appetizing sauces and pies from a combination with dried apples—or fresh sour ones—and how tasty they were in the lunch basket! But there is still another fruit which may be used advantageously.

Nature has thrown into juxtaposition with the elderberry the wild grape. At the same time of year they are ready to unite in producing a pleasant and wholesome article of food, the seeds having been strained out after

boiling. About midwinter, when other fruits begin to pall upon the appetite, bring out the elderberry jelly or jam and be surprised with its wild, inviting tang.

Memories are stirred into being. It recalls the autumn and the afternoon tramp when the berries were gathered. The tussocks of withered sedge on which the bush grew—how you stopped and drew back, remembering the holes beside them where snakes might easily hide, and even the chance of quicksands! Here and there, where a spring oozed up, you were liable to plump into a wet place. But mostly you kept on the solid ground of the high bank above the Run; for, while the elder likes to have water not far away, it stands on solid ground by preference.

The gathering of the glossy, dark bunches and, later in the starlight, sitting on the friendly porch plucking the berries from the stems, while the family group is near, spinning yarns and retailing the day's doings before retiring to rest, all come back to mind. And after that, the peaceful slumber of the weary, for never is sleep more perfect than after a day's outing: picnicking, boating, nutting, elderberrying, in the golden autumn sunshine among the woods and swamps and streams which lie among the hills of the terminal moraine in the Scioto basin.

Across the fields and bogs is heard the shot of the hunter. The cottontail is bagged by the good marksman. The whirr of the quail's wings is heard less often than of yore and suggests the propriety of sparing to the country the friendly fellowship of Bob White's call by additional protection to this desirable bird.

Sometimes a woodcock is found in the game-bag; less often, a plover. The pheasant has failed to respond to the efforts of the Government at propagation. Perhaps some genius of the future may evolve a sport for men lacking in the destruction of bird life, yet including the zest of the search and the rural tramp.

With summer comes the sunflower and all the golden sisterhood of the Compositae. As the year matures she decks herself with the purple and white of the aster, the brilliant blue and red of the lobelias, retaining for her final solace the cerulean charms of the fringed gentian.

Where the buttercup and the water-crowfoot spread their enchantment, the withered leaves have fallen. The duck-weed, the pondweed, and the selaginella have had their day. Gradually the birds disappear, taking wing for their tropical haunts. Comes a day when a cold breath whistles through the naked trees, fringes the stream with glistening ice among the ragged

sedges and rushes, and the water, shrunken and hushed, steals along under a gray, portentous sky.

TOBACCO.

"If," answered Mejnour, "a stranger had visited a wandering tribe before one property of herbalism was known to them; if he had told the savages that the herbs, which every day they trampled under foot, were endowed with the most potent virtues: that one would restore to health a brother on the verge of death; that another would paralyze into idiotcy their wisest sages; that a third would strike lifeless to the dust their most stalwart champion; that tears and laughter, vigor and disease, madness and reason, wakefulness and sleep, existence and dissolution, were coiled up in those unregarded leaves—would they not have held him a sorcerer or a liar? To half the virtues of the vegetable world mankind are yet in the darkness of the savages I have supposed. There are faculties within us with which certain herbs have affinity and over which they have power. The moly of the ancients is not all a fable."—*Bulwer.*

We are apt to regard the earth beneath our feet as subject to blind and meaningless chance. What we call "natural causes" are placed in a catalogue of events quite aside from those which we designate as "providential." Perhaps we do not understand Nature as well as

we might, although her works are all around us and we familiarly know her as Nature and place her in the feminine gender.

It is very misleading.

Let us read again the story of ice invasions with the intervals of mild temperature, when forests flourished and great creatures roamed over the land. We can not even approximately be certain of the length of time involved in any one of them. Nature is unhurried. Time, as we know it, is a moment in her calendar.

From whence came the protozoa? One great scientist calmly guesses that it may have reached us in an aërolite.

However, from this minute but perfect origin, animal life has developed until in the human species the highest handiwork of creation appears. During this procession of species many have disappeared from the earth. Some that we know of in modern times have vanished, or are about to do so.

Within our brief period of history many nations of mankind have risen and fallen. Here, as elsewhere, Nature is at work—always, untiringly, systematically at work. The closest observers of her method in the human sifting reduced her operations to the law, "Survival of the fittest."

This we have learned: the further the

physical being departs from Nature the more liable does it become to annihilation. Fresh air, pure water, sound sleep, sufficient exercise, proper food and shelter and companionship make the chief requirements for the body.

But Nature super-added to the animal, mental and spiritual qualities.

The human race is, spiritually, an experiment. This wonderful Worker endowed the race with a power hitherto, so far as we can judge, withheld from created life. To know good from evil, to choose the good and refuse the bad; to imitate the creative power by invention; to aspire; to have self-control, courage, self-sacrifice; to be benevolent; to be philanthropic; to cultivate the mind and develop the higher faculties; to study Nature and reduce her phenomena to science—what a vast and noble field of occupation lies before the race! It seems like the most reasonable result of this high attribute of humanity that they should recognize their origin and in spirit commune with the kindred Creator.

This is the case to some extent. Like the earth at our feet, the race has come out of a dim past through many changes and trials.

"From the strong will and the endeavor
That forever"

spur to achievement and advancement, mankind is progressing. The belief in God and immortality have always existed.

And all the while, winnowing and sifting, Nature is at work.

Where the Run cuts its way through a strip of land redeemed from the neighboring forest, a humble cabin shelters an old negro and his wife. A patch of tobacco grows luxuriantly in the little enclosure which is the garden. When the pink blossoms begin to appear, he tops it. In due time the plants are hung from poles to dry. This is all visible from the road. What the further destination of the plant is can be guessed.

It is probably one of the earliest imports into Europe from the New World. We read that the French ambassador at the Court of Portugal brought tobacco into France in the year 1560, as a valuable medicinal drug. Its introduction into England was discouraged and laws passed against its cultivation and import which are still in existence.

At the time of the settlement of America by the whites, tobacco was raised by the Indians. Precisely as the old negro cultivates it to-day did the aborigine care for this plant, which he solaced himself with smoking.

So popular did its use become that laws were passed in the early days of the colonies forbidding its cultivation to the neglect of food crops. This feature repeats the same history at the present day, where some counties on the Ohio River raise tobacco to the total neglect of other crops.

The war carried on recently among tobacco growers to keep the prices up recalls the fact that, notwithstanding its high price, the poorest man must have it, though his family should starve. A large per cent of the nation's support comes from the tax on tobacco. Indeed, the United States has been at great pains to select and cultivate the best and most popular varieties of tobacco, making investigations in other countries in regard to its propagation. Millionaires dwelling in palatial homes owe their wealth to profits on this plant and its products.

Turkey and Persia make large use of tobacco.

Let us look a little into the merits and history of this plant. The Indians were, at the time of their discovery by Columbus, neither powerful nor intelligent. They were barbarous and warlike. They dwindled away in the most remarkable manner. Discoverers report that it was the practice among them at that time

to make war upon each other for the purpose of capturing children, whom they adopted into their tribes in order to keep up tribal existence.

In France, the first country to adopt its use, nearly a century ago it began to be whispered that race suicide was taking place. The whisper grew to a loud accusation. There was no explanation given for the phenomenon. It is also characteristic of this people at the present day that they are undersized. Their soldiers especially show this peculiarity. Soldiers are usually the picked men of a nation in physical development.

Since then America has had the same charge of race suicide placed against the wealthier and older families. Here also it is noticed that the men are deteriorating in height, thus throwing into apparent prominence the perfection of physical beauty of the women and the finer development of certain classes of immigrants and their descendants.

Women, with few exceptions, have not taken kindly to tobacco. It is probably owing to this that the white race has escaped a more speedy decadence. But how long may this be said? They are generally the daughters of men who are its slaves and will, in time, succumb to the poison inherited in their blood.

For tobacco is a poison. Its first symptom is to render the user ill and nauseated. Even the smoke in the atmosphere has this effect. All the lines of travel, the air of the hotels, is permeated with the noisome fumes of this disgusting weed, so popular among our civilized and enlightened (?) nations.

The effect of the use of tobacco on the young is to deteriorate both mind and body. Those who use it are not as apt pupils as those who do not. Frequently death results from its use by boys. But this does not deter the boys of the land from acquiring the tobacco habit. They may often be seen sneakingly smoking cigars, pipes, or cigarettes.

As so many men use tobacco in some form, boys imagine that it is a sign of manhood, and hasten to copy their example. This it is which makes it impossible to control the use of it among boys. When men begin to govern themselves in the use of tobacco there may be some hope of reaching the boys, but not before.

Among men the "tobacco heart" is prevalent. Many are unfit to pass the military test in consequence. Hallucinations and strange nervous symptoms accompany its use with some.

I was once walking with an old man from the country on a city street. Smoke from a

cigar reached him. "How good that smells!" he murmured.

"Do you not smoke?"

"Not now. Once I did. But there came a time—and O! what I suffered! Never again! Never again!" He shook his head with decision.

At another time it was a man from political life.

"Twenty years ago," he said, "I smoked. My friends presented me with boxes of the best cigars. Unthinkingly I used them until, one day, as I sat before the fire smoking, it occurred to me that my health and nerves were not as sound as they had been. I had grown nervous to an uncontrollable degree. Suddenly it came into my mind that I had brought it on by the use of tobacco. I took the cigar from my lips and threw it on the coals.

" 'There!' said I, 'that is the last tobacco I shall ever touch!'

"I kept my word, too. It was a severe struggle, but I conquered."

Recently we have read of a man who laid aside the money he had been accustomed to spend on tobacco, and in the course of not so very many years he had saved enough to take a trip around the world. With how much added zest of mind and body he would enjoy that trip!

A young man, about to return to his studies at a New England university, in conversation with a physician acknowledged that tobacco disagreed with him, but in order to meet his fellow-students on a common social ground, he had tried to acquire the habit of smoking.

A clergyman made a similar confession; and the physician, adding his testimony as to the injurious effects of this poison, acknowledged a sparing use of it as a social concession. Slaves, every one, where they might be apostles of freedom!

A lack of moral stamina, an absence of the virile qualities which make strong, ambitious men, is noticeable among those addicted to the use of tobacco.

The heads of business houses remark on the scarcity of reliable, able young men to fill the positions of trust and leadership.

Lately a new charge is heard: that a dullness of the moral sense is apparent. People are growing to be more lenient and indulgent toward sin and sinners, probably because so many of them have near relatives who are the delinquents. Penitentiaries are populous with embezzlers from banks and other places of public trust. Bribery is common. The men who so little regard the badge of citizenship as to sell their vote increase on all sides. In courts

of justice their conviction is next to impossible because of perjury and lying.

The cities are full of loiterers, idling their lives away, cigar-in-mouth. Even the candidates for the highest positions in the gift of the people are pictured in the shameful pose of cigar-in-mouth in the daily papers. Are the enlightened nations of the earth rotten to the core with tobacco?

It is not from the ranks of the tobacco users that our leading statesmen come. It is from the pure air of the country, from the hearth of the farmer where temperance, honesty, and economy are practiced, in order that learning may have fitting opportunity. These men too often, when brought in contact with the social mill, adopt the habits of the new environment, forgetful of the fact that it was their freedom from such grossness that fitted them for the rank of leaders. Had these men the strength of character to maintain their native purity, what aid it would give to the social reformers, who find the work of protecting the young so difficult!

There was a time within the remembrance of many—and I fancied the time had not yet ceased—when men did not smoke in the company of women without asking permission. Now, I have heard the mothers of young women

complain, the young men do not ask permission, but puff their tobacco smoke anywhere, like boors.

Often the young women claim to like it. Sometimes they also smoke cigarettes, but thus far, I am thankful to say, I have seen very little of it. Yet a baleful sign of the times is the fact that popular novels are admitted to circulation in our public libraries wherein the smoking of cigarettes is one of the features of the heroine's boudoir life.

I know of nothing more revolting in civilized public life than the sight of a boy, youth, or man, in health and the alleged use of his mind, indulging in the use of tobacco or any other drug.

Stimulants, narcotics, and sedatives are for the sick and feeble, and in time of stress and unusual effort, for the worker, the watcher. But for the everyday life of humanity it is wise to let such things alone.

If there is any consolation in the weed, leave it to the old, the decrepit. The glory of the young man is his strength, not of body alone, but of mind and the ability to maintain self-control.

The glory of woman is her purity and ability to transmit a sane mind in a sane body to her offspring. It is discouraging to contem-

plate the future of the human race if some means is not taken to secure this inheritance to posterity.

From certain departments of labor and business the man who uses tobacco is debarred. It is time that he should be excluded from the school and college. Above all, he should be excluded by the mother of marriageable daughters from the privilege of their society in the home. This sounds mighty drastic, I am aware, but there is no greater business in the world than the production of the next generation. When the study of eugenics is taken up in the schools, the future mother should be impressed with the importance of giving her child the best chance possible. When women come into their rightful heritage as co-workers with man in making and executing laws, we may look for many improvements in the human race. But these must have their foundation in the family life. This sentence should be inscribed in the heart of the wife and mother: "Every wise woman buildeth her house, but a fool teareth it down with her hands."

I knew a large family of girls whose mother forbade social entrance to the home of any man who used intoxicating liquors. Not one of them married a drunkard. In those days tobacco was not regarded as the harmful poison which we

have come to know it, or she might as easily have included it in the interdict. Let the modern mother and daughter begin the crusade against this curse of the human race and so do what their influence may accomplish to correct a popular evil.

It is a hopeful sign of future improvement in the human race that the God of nations is bringing up for the work a new contingent in the political field—the women. The forces of evil have set themselves to resist this progress, even hoodwinking some of the less intelligent women to join them in their anti-suffrage war, but let no one be deceived. The contest is between Right and Wrong. Let every man and woman choose which to serve.

Some poisons—opium, for instance—which are speedy in effect and promptly baleful in their influence, however attractive to the victim, sound their own knell to the general public, and governments enforce laws against their misuse; but tobacco is fostered, encouraged, accepted by men.

When churches and physicians entertain men with "smokers," what show is there for reformation? I recall an incident. When I was abroad I chanced to mention how much I suffered from the disagreeable fumes of tobacco. A Church of England clergyman told

me that he could give me a remedy: take a dose of brandy, and all unpleasant symptoms will disappear. Precisely! They go hand-in-hand together, alcohol and tobacco. It is well that the fight against one of these is on; for Nature, when she gifted us with a knowledge of good and evil, did not omit to provide a moral backbone, if we choose to use it.

A professor in an Eastern college announces that women are inferior to men because they are less sophisticated than man and so much nearer to Nature in their organization and habits. He had tobacco in mind, probably. Never has woman received a higher compliment.

Nature is a manifestation of God. "Ye are the temple of God." "If any man defile the temple of God, him shall God destroy."

THE WOMAN BOTANIST.

ALWAYS a voice is calling
In the city's roar and clangor,
  Or the silence of the room;
Now with tender message pleading,
Or, again, with loud insistence
  When the world is all abloom.

'T is the voice of the lone wild-wood,
Of the forests man-forsaken,
  Of the meadows flower-gemmed;
Of the streams that murmur softly
O'er the white and shining pebbles,
  'Tween the banks with sedges hemmed.

'T is the voice of Mother Nature,
From her cool and dim recesses,
  In the places undefiled.
O, I hunger for the woodland,
And I hear her, and I answer,
  And I seek her, I her child!

THERE is this advantage in being an amateur: one may break into verse if so inclined. A technologist or professor is not supposed to have any such inclinations.

The true botanist is born, not made—as you may have heard in regard to specialists in other fields. When, as a child, she sought the woods on holidays, bringing back the precious spoil of flower, fern, and sedge, the woman who would desire to name and classify was foreshadowed.

What is it for a woman to be a botanist? With maternal, domestic, or social duties, to say nothing of literary, if she incline that way, and each an occupation in itself, how shall she find opportunity to cultivate acquaintance with Nature and reduce her observations to a science?

She will do it because she was born to do it; because within her is the heaven-imparted kinship with Nature which is the open sesame to that kingdom of delight. But she will do it under difficulties.

"Who is it goes 'round the woods and 'round the roads and leaves a rag on every bush?" asks the facetious riddler. The answer is not "The snow," but, "The woman botanist." Let them have their fun; there is no truth in this, I assure you.

Yet she is no respecter of good clothes. One

day she will go "calling" on her country friends, dressed in "best bib and tucker," quite determined to conduct herself like an ordinary Christian, to that end abstemiously leaving her vasculum at home; yet she will come back with her hat awry, her hair flying in strands and tangled up with bits of branch and leaf, her best lace handkerchief lost—she went back and found it in a roadside ditch—her fine mull gown with zig-zag tears in the front breadth, her sleeve torn up half its length—but radiantly happy and totally impervious to reproof. And why? Because in that sheaf of spoil she carries there are specimens of the wild flowers never before seen by her.

She will take impromptu Turkish baths in an attic, heated under its slate roof by the summer sun to the temperature of an enameling oven, or thereabout, while placing her specimens in press or changing the papers during the drying process. She will litter her vacant rooms with all manner of plant débris, though otherwise an immaculate housekeeper. Under the atlas and dictionary you will find her treasures, and she will contrive to invest them with a romantic and sensational personality almost astounding to her family, who, nevertheless, in their moments of disillusion and impatience, sometimes rail and scoff.

She may be said to lead a double life, if doing twice as much as an ordinary woman is a scale of measure of her achievements.

"Ah!" you say, "this is not the lady we know, who is an M. Sc. or Ph. D., and who calmly works in a laboratory, unharassed by household cares or maternal duty."

It is an extreme case, of course, but I am glad to quote it, since it shows conclusively that women may be imbued with a love of science for its own sake, and pursue it in spite of obstacles. The qualities of mind are similar in the sexes. We reap what we sow: twaddle and tittle-tattle in the one, aggressive war and crime in the other, under suitable culture, or a high standard of personal responsibility in both, if we so demand.

But while the road to scientific attainment is for the man broad and well-paved through centuries of use, there is generally for woman, when she dares to walk therein, a look askance and a cold reception. But she will not mind that greatly—the woman who truly loves Nature. She will be instant in season and out of season, and it need not discourage her if her devoted friends arrive at the conclusion that it is the latter.

Disappointments, discouragements, adversities constitute food for hardy natures, and no other need attempt the road of science.

When taking her rides abroad in company with unsympathetic companions, collecting, what had at first been conceded to her as a hobby of possibly brief duration, like any other fad, by reason of prolonged and persistent continuance, became burdensome; and finally, objection was not unfrequently made to stopping for botanical acquisition. In this emergency, and after being summarily whisked by coveted treasures, a new expedient suggested itself.

Gloves and hand-bags had mysterious ways of falling over the wheel into the road in near proximity to new and attractive weeds: in getting out to recover the one, she audaciously insisted on securing the other. Her soul is still harrowed by recollections of a much-desired specimen, dimly identified at a moment when nothing was at hand to drop—her hat being the only article possible to so use, and it tightly, alas! pinned to her hair. What a pity that heads could not be conveniently tipped off on such interesting occasions! And that specimen has never been seen since, and is still absent from her collection.

Too soon, however, the boys caught on to these tricks, and openly accused her of them, on the last occasion of the perpetration of the deception, riding defiantly away and telling her she could walk into town by herself. This she

serenely proceeded to do, but was shortly met by the repentant though sulky driver, who, however much he might desire to bring her up in the way in which he thought she ought to go, doubtless had compunctions of shame about having strangers see his only mother walking along the dusty road like a common tramp, she not in the least appearing to care.

The social doings of her own sex lose something of their attractiveness to the woman who botanizes. An afternoon reception is on her tablet for the day, and if she has a new gown she dons it, feeling its strangeness, perhaps conscious that she is an object of observation. Or, having nothing new in her wardrobe, she spends valuable time in looking discontentedly over the old apparel, finally selecting something that "came out of the ark."

She attends the social function: is probably invited to partake of food for which she has no need; talks on topics in which she has not the slightest interest (but so "safe!") to persons who in no way attract her, and comes away, hoping to goodness that she has not said anything which will hurt any one's feelings.

Perhaps her companions indulge in post-prandial ridicule of the hostess or guests—it is horrible, the liberty some persons give

themselves: they could ridicule the angels in heaven!

How different is an afternoon in the woods and fields! Let us hasten thither, for the time passes so quickly.

It is spring, and the fresh grass is sprinkled with buttercups and spring-beauties. How divine are the violets! Or the phlox fills the spaces with a misty flush.

June! O love and roses and the fullness of life!—can we ask any more? Kind Heaven, how good to all created! Let us lie full-length, with faces in the grass, and hear the stream ripple and sing over its rocky bed.

If it is autumn, a thousand hands reach out to grasp and hold us.

And the refreshments? A twig of sassafras takes us back into childhood; or the golden-brown, wrinkled berry of a May-apple. A rose-haw touched by the frost, or an amber ground-cherry, in its withered, bladdery calyx-cup, cheers and inebriates with the exhilaration of new-found old delights. "Mary, did you ever taste a leaf of the lady's-thumb?" and you trick her into it. O, don't mention pepper after that!

The sun sinks low, and we must hasten home. No one has had a thought of the clothes she wore; only of those she has seen, surpass-

ing the glory of Solomon. If the plant-people have criticised, there has been no consciousness of it.

But the blood courses through the veins more healthfully. How bright and good and sweet a thing the world is after all! Ah! we have been in the Presence. Heaven seems so near. We will live worthy of it. We will love and help each other and be kind and true, keeping high faith with all the hearts that trust us!

October, 1900.

Nor alone because of what the women of Ohio have done in the botanical work of the State, but that they may be encouraged to greater accomplishment therein, is this written.

The fame of many a woman in the past has been merged in that of her husband or other male relative, and history fails to give her any credit. The false sentimentalism, amounting to a dogma with some, that a woman should not wish to see her name in print, is scarcely outlived, but we are getting along, as the world grows, toward a basis of independent personal responsibility.

In any case, there is nothing more delightful to a true woman than to help somebody to further a humane and beneficial cause. In a

work of this kind her highest nature revels, expands, and bursts into blossom. It is an adorable quality, therefore let us recognize it. With it she exalts the race. But it must be stamped in the mint of golden coin and made a standard of human obligation if the world is to gain the full benefit of it.

Ohio has had her share of women who have aided relatives in scientific work. It was the wife of William Sullivant, the noted Ohio botanist, who first found the flower which is known as the *Saxifrage Sullivantia,* and brought it to his attention. Finding no mention of it in his books, it was sent to Asa Gray for identification. He immediately recognized it as a new addition to the *Genus Saxifragaceæ,* and was named by him in honor of its discoverer. In Green Lawn Cemetery, Columbus, Ohio, where she is buried, there is a bust of Mrs. William Sullivant which bears a wreath of this graceful flower sculptured across the bosom.

Miss Josephine Klippart aided her father, when State agriculturist, with her skill in drawing. The fine paintings of the Buckeye and the Dogwood in the botanical department of the Ohio State University illustrate her taste and artistic ability. In faithfulness to nature these plant portraits could not be excelled, having wonderful accuracy of detail.

Mrs. Wormley acquired the art of engraving that she might assist her husband in his scientific pursuits.

Dr. W. A. Kellerman, botanist of the Ohio State University, in the Preface to his "Elements of Botany," acknowledges the assistance of his wife. The botanical work, and especially the scientific articles by Mrs. Kellerman, place her in the foremost rank of Ohio botanists. She has assisted in her husband's work, including nearly all of his publications, and been a constant contributor for several years to periodicals devoted to natural science.

Mrs. Sarah S. James was the assistant of her husband, Prof. Joseph James, in his botanical labors.

Mrs. Laura Morgan, of Preston, Ohio, is, as well as her husband, a noted authority on Fungi. She has made a fine collection—herbarium, we may call it—of paintings of the higher fungi, probably the largest and best of the kind in the world, and of rare scientific value. Her work in plant portraiture and botanical acquirements is commemorated in the scientific name of an interesting wild Ohio mushroom, the *Hygrophorus Laurae.*

Miss Hannah J. Biddlecome has done an invaluable service to science by making known to the botanists the rich flora of mosses and

liverworts of Ohio. When living in Springfield, she industriously collected and carefully studied the tiny bryophites of Cedar Swamp, Clifton Gorge, and vicinity. Some rare plants she brought to light, and discovered several new species, one of which was named in her honor, *Trichocolea Biddlecomei.*

Mrs. E. J. Spence, of Springfield, ought to be mentioned in the same connection. She and Miss Biddlecome were constant companions in this delightful and useful work. Mrs. Spence devoted herself, as well, to the flowering plants, and the State herbarium at the university contains several hundred specimens that testify to her botanical activity.

Special mention is also deserved on the part of Mrs. E. W. Claypoole, now of California, who, during her long residence in Ohio, worked constantly with her husband, both at Yellow Springs and Akron. Botany was a field of enticing interest to her, and she did much toward making the Ohio flora known and appreciated at home and abroad. She has contributed some botanical articles to magazines. Her love of nature is inherited by her two daughters, both of whom are now instructors in Cornell University.

Mrs. Sara F. Goodrich, Mrs. Theano W. Case, Miss E. J. Phillips, Miss Hulda Hoff-

man, Ruth E. Brockett, Cora McFadden, Lizzie Davis, Florence Tuckerman, Ella Keeler, Ada G. Wing, and the writer, contributed to the collection of the State flora.

Probably others assisted in this State-wide study of the flora of Ohio whose names have been overlooked. It was a beneficent and popular method of securing attention to a science too much neglected by women, as the above brief list proves.

There are many who might adopt the study if they would. Pedestrian rambles are very popular, and with this object in view, increasingly delightful. Many have their own conveyances, bicycle riding is general, and the interurban lines yearly increasing in number.

The espionage of the vegetable kingdom thus established, it can not fail that data will be furnished which will prove useful to the economics of the Nation. The plants furnishing material for food, medicine, clothing, etc., will be brought into general notice, while undesirable or noxious weeds may be prevented from spreading.

In this work the co-operation of the farmer is needful, and intelligence in regard to the botany of his locality most desirable. Here the farmer's wife and daughter may lend their aid. For women this knowledge has increasing

value, and many a woman, all over the civilized world, is turning her attention to special branches of agriculture. Indeed, among the employments suggested for women at a recent woman's congress was agriculture.

Woman has an originality of observation to her credit.

Constant vigilance is the price of freedom from unwelcome vegetable tramps. Roads are narrowly fenced, and laws passed to restrain the gypsy squatter and horse-trader from loitering along the way and encroaching upon the comfort and health of the tiller of the soil and his herds, but the tramp seeds which come in foreign grains would gain permanent hold if stringent measures were not used to restrain them. Boards of Health exist for the prevention and isolation of diseases; so, in like manner, do police and detective forces exist for protection against the immoral and dishonest classes. Religious, educational, and moral organizations exist for the uplifting of the people to higher spiritual, intellectual, and ethical standards.

In the vegetable world all these forces are represented in the botanical and agricultural institutions, and the need of wide co-operation is not sufficiently recognized.

There are beneficial plants to be introduced

into new localities, thus increasing the economic value of the land. While men on farms may be too busy for the task, the women in towns and villages may readily take up the work of representing the flora of their vicinity in the State botanical building. She who commences as a mere collector will in all probability develop into a student.

Especially should women be interested in this subject, since it is becoming daily of more importance in the avocations of their sex. The Countess of Warwick has classes of women training in floriculture and the production of berries. Women who are college graduates are making good livings in this department. The culture of flowers for perfumery and extracts is almost unknown, but might readily be undertaken by propertly instructed women. Indeed, the very latest from this field is that a woman utilizes the production of mints in swamps for this purpose, making a comfortable income, and that farmers are installing stills for the extraction of the essence of mints, which they cultivate by the acre in soils especially adapted to the growth.

The ravages of insect pests and the scale call for increased vigilance over the vegetable kingdom, in which women may take a part.

Elizabeth Christina, daughter of Linneus,

was the first naturalist to observe the electrical sparks to be drawn from the nasturtium—in particular, the orange and yellow colored blossoms—and the inflammability of the exhalations of certain plants. One of the most important discoveries of modern times, radium, was made by Madame Curie while assisting her husband in scientific work. Though rare, one never knows how near may lie such rewards of patient research.

1900.

NOTE.—Since the foregoing article was printed—in the Columbus *Dispatch*—twelve years ago, important economical changes have taken place, not the least of which is the high cost of living.

The tide of humanity drifting into the cities from foreign lands and from the farms, causing an increase of consumers and a dearth of laborers for the production of the food supply, is a serious problem. That it is receiving beneficial solution is proved by the fact that the immigrants are steered from the cities to the lands where laborers are most needed and that the study of agriculture is receiving increased attention in the schools.

Louise Klein Miller, curator of school gardens in Cleveland, is carrying on a work which must result in increased knowledge and inter-

est and the development of ability for agriculture.

Near one school building I noticed a practical example, where a portion of a vacant lot had been used by pupils for the cultivation of a variety of flowers and vegetables. Various uncommon trees and shrubs ornamented the grounds about the school. I was told that these were in time to be labeled—a very important part of their usefulness in public instruction.

This lady also writes extensively for the newspapers and gives lectures on botanical subjects, greatly to the advantage of this beautiful city and the increased intelligence of its people. Miss Harriet Keeler is similarly occupied.

The vast sums bestowed in the endowment of universities and libraries might well be shared in promoting improved methods and opportunities in farming. It is in the right direction that the Government is offering prizes, not only to boys in the Corn Clubs, but to girls in the Tomato Clubs of South Carolina.

Intensive farming will furnish a measure of relief from high cost of living. Through increased agricultural knowledge the thrifty householder may raise in his little garden many

of the vegetables needed on his table. The farmer or his children may make money on market produce.

In Stark County and in and around Canton I observed this style of farming in successful operation. And this brings us back to the reclamation of the bogs and their disappearance from the haunts of the botanist.

Swamps which are irreclaimable by drainage are, in China, cultivated as "water-gardens," producing a succession of valuable food crops from plants especially adapted to aquatic culture. In time the American agriculturist may attain this knowledge, and the useless swamp will become a valuable asset.

The following extract from a letter from Mrs. Theano W. Case, of Canton, gives insight in a few sentences to a most interesting portion of the State:

"It is ten years since I went much into the swamps, so it might be misleading to say certain things grow here now, because I do not know that they have escaped the roadways and the vegetable gardens that have nearly annihilated our delightful wild flower gardens.

"We have the Pitcher-plant; the fringed gentian grew in great quantities on the banks of the stream flowing through Canton; also the closed gentian.

"We have the Arisaema dracontium (green

dragon) and Peltradra Virginica (green arrow-arum). We had Habenaria hyperborea (tall, leafy, green orchis); the plant is described by Gray. It belongs to the far North, but the 'terminal moraine' runs south of us, and we have—or had—several 'far northern' plants, such as Linnea borealis (twin-flower), Chiogenes serpyllifolia (creeping snowberry), Utricularia gibba (humped bladderwort), Cypripedium reginæ (showy ladies' slipper), C. candidum (small white ladies' slipper); C. parviflorum (small yellow ladies' slipper); C. acaule (Moccasin flower; stemless ladies' slipper).

"There was a rubbish heap near a railroad upon which, for years, grew Gaura parviflora (small-flowered gaura). Gray does not mention its being found east of the Mississippi.

"Andromeda polifolia (wild rosemary) grew rather abundantly in our swamps at Myer's Lake, two and one-half miles from Canton. It is a northern shrub, rare here. Arbutus formerly grew here, but now we have to go twelve miles for it.

"The swamps close to Canton are rapidly being made into celery fields."

And since the partial failure of this crop in the severe winter of 1911-12, onion culture has been added. This bulb has attained wonderful success in the Scioto bottoms or "black lands" in recent years.

On the water-shed of this portion of the State, where the heights drained are not great,

should the depressions be clay-lined, the accumulating water forms lakes, which are known to the geologist frequently as kettle-holes.

These lakes have become popular summer resorts of neighboring cities and towns. They may, in time, follow the fate of others of their kind, which have been filled with peat and marl. The *chara foetida* takes possession of the slow-moving streams and small bodies of fresh water, requiring constant dispossession if the channel is to be kept clear.

Situated between Navarre Street on the north and Fairfield Avenue on the south (in Canton) is a wonderfully valuable—to the botanist—strip of swamp, through which runs Nimishillin Creek. An effort is at present being made by Mrs. Case and other friends of nature to save it from the encroachments of the manufacturer and reserve it to the city as a Nature park.

Originally a tamarack forest, as these trees disappeared the sphagnum and pitcher-plants (Saracenia purpurea) went along. Still a wealth of rare floræ remains. It was in the early part of the month of August that Mrs. Case introduced me to this interesting spot. It lies immediately below a line of houses and appears to have been considered a suitable catch-all in disposing of rubbish in house-clean-

ing times, as one has to stumble over old cans and broken crockery—kindly covered by the summer with a mantle of vines—before reaching the moist lowlands. It is not surprising that its friends are anxious to rescue this bog from such a fate.

In spring the False Asphodel (Tofieldia glutinosa), Red Wood Lily (Lilium Philadelphicum), Blazing Star (Chamaelirium luteum), and others mentioned above are found here, with hundreds of others more commonly seen.

Almost the first thing I noticed was the wide carpeting of Grass of Parnassus maturing for bloom. Zygadenus and Ornithogalum were still in bloom. Poison Sumac was seen, and the Cranberry. Looking close to the ground, the Sundew *(Drosera rotundifolia)* spread its rusty coloring. Every tiny hair of the fringe of glands bore a drop of dewy secretion which glistened in the sun and threw out attractive lure to the insect life, which is thus captured to nourish this curious plant.

No attempt can here be made to mention all the species of plant life here seen, but the surprise and pleasure afforded by a wide space covered by the brilliant spikes of Gay Feather (*Lacinaria spicata*) must not be forgotten.

My companion informed me that Mr. Edward S. Steele, a botanist of Washington, D. C.,

who has written an article giving a plea for this precious swamp, has here discovered a number of plants whose environment had developed characteristics which called for new names. Among these is one of the *Hypoxis hirsuta,* which may be a distinct variety.

Mrs. Case is also a student of Mycology and is at present engaged in making a collection of the fungi found in her vicinity, of which she makes painted copies. Over one hundred species are represented in her illustrations.

Other names of women who are devoting all or a portion of their time to natural science have appeared in recent times.

Miss Clara G. Mark, of O. S. U., is especially interested in Bryology and Geology. Miss M'Elroy is pursuing post-graduate work in Botany. Clara A. Davies, Dora E. Johnson, Rose Gormley, Susan P. Nichols are mentioned among women interested in this study.

Miss Freda Detmers, Ph. D., Assistant Botanist of the Botanical Department of Ohio State University, is the author of a number of articles on botanical subjects contributed to scientific periodicals. She has done valuable research work for a number of years.

"A Physiographic Study of Buckeye Lake and Vicinity," in the May number of *The Ohio Naturalist,* by Dr. Detmers, is very interest-

ing, carrying the reader into the glacial epoch and pre-glacial remains.

"That this swamp," she writes, "which was known as the 'Big Swamp,' dates from early post-Wisconsin time is shown by the presence of a cranberry-sphagnum bog which still exists in Buckeye Lake. This bog, locally known as the Cranberry Marsh, lies in the eastern part of the lake, close to and parallel with the north shore. . . . The vegetation is of peculiar interest; for it consists of typical bog plants characteristic to-day of high temperature latitudes and generally accepted to be relics of early post-glacial times, stranded and persisting, and now surrounded by the normal vegetation of the present climatic conditions.

"The typical bog plants are several species of Sphagnum, the Cranberry (Oxycoccus macrocarpus), the Sundew (Drosera rotundifolia), several species of bog sedges, as Carex limosa, and C. filiformis, the Buckbean (Menyanthes triloba), and Scheuchzeria palustris, forming a bog-meadow bordered by a zone of bog-shrubs, of which the Poison Sumac (Rhus vernix), the Black Alder (Ilex verticillata), and the Choke Berry (Aronia arbutifolia and A. nigra), are the most characteristic."

Miss Detmers further relates how this Sphagnum Bog was separated from the main land and floats, an important link in the study of the earth's history.

This article, under the title, "An Ecological Study of Buckeye Lake," illustrated and at greater length, appears in the "Proceedings of the Ohio Academy of Science," in pamphlet form, a valuable addition to the student's sources of instruction which should be placed in every college and high school in Ohio, at least.

There are National flowers and State flowers by selection. Towns and cities also have a prevalent flower, either native or adopted. The city of Buffalo, N. Y., has the Marguerite or white, ox-eye daisy. It pervades the streets and suburbs, trailing off into the country. It has become such a pest to the farmer that they have a stringent law against it.

In St. Louis, Mo., the hoary vervain, with soft, velvety leaves, pervades the vacant lots and waste places.

Cleveland has the Saponaria, or Bouncing Bet. It is a fresh, pink-and-white, decorative flower, growing everywhere. The little children love it; they will stop in their play to gather a bunch. I often did the same thing myself. It covers the cinder banks along the railroad at the entrance into the city. It is on the sidewalks and in the parks.

I do not know of any flower more prevalent in my own home town, London, O., than the

dandelion. It is an all-the-year-round flower. Give it a day or two of sunshine and warmth after a thaw, any time during the winter, and it comes with a smile in the sod of the lawn and looks at other smiling faces of its kindred.

It is beautiful to look at in the spring when the grass is so green, but it is not a welcome guest. It, too, has taken possession of the fields on the edge of town. The sod of England is not troubled with it as is that of this country. But the lesser celandine is in its place. I wonder which is the worse, or if either is in reality harmful?

Along the railroads in May and June the wild strawberry has taken possession of the banks, furnishing a luxuriant crop of fruit to any who may see fit to gather it. This is a plant entirely beneficial in every respect. The roots bind the soil, the leaves make a thick carpet which prevents its washing away and the fruit is a blessing to the gatherer.

But there are other plants along the roads which are gaining great headway and taking possession of orchards and fields to the detriment of the land and the future expenditure of labor in ridding the soil of them. Among these are the wild carrot, the horse nettle, the

yarrow, and others, according to the locality. The Experiment Station at Wooster sends out bulletins of warning against these pests which should be carefully heeded.

Not infrequently mention is made in the newspapers of cases of sickness and death resulting from the use of buckwheat flour. As buckwheat—*Fagopyrum*—is a valuable and nutritious grain, the cause of the poisonous effects must be looked for in some admixture with a foreign substance.

Ripening about the same time of year as the buckwheat is a plant which may escape the observation of the farmer who is not posted in regard to its dangerous qualities. This is *Lobelia inflata,* commonly known as Indian Tobacco. It is a simple, harmless-looking weed, from six to eighteen inches high, with pale blue or lavender flowers, the calyx of which becomes swollen with the numerous seeds which it produces, small, shining, black bodies, the effect of which, taken internally, is to produce nausea and death.

Farmers and those reaping the field of buckwheat should be on the lookout for this dangerous enemy of human life. Special instruction in regard to it should be given in schools and agricultural classes.

An event happened.

I had been meditating on the subject of "Character in Plants," especially on the fancied resemblance to reptilian qualities of certain plants as exhibited in the drying process while in press. The Arisaema dracontium and related species were chiefly in mind, marveling how long the curling of the sensitive leaves continued when the pressure was removed, and even when separated from the nourishing root. It reminded of the gruesome quivering of the flesh of frogs and turtles, presumably dead.

Hurrying around the north side of the house in the June twilight, I stumbled over something, entangling my feet like a piece of wire, and made some remarks of an uncomplimentary nature on the carelessness of boys. Returning to the spot on the following morning, to gather it out of the way, the "wire" was found to be a growing one. Taking its several yards of length from the ground, it curled, writhed, and slid from the fingers like a very snake. This resemblance was further accentuated by the terminal buds and the developing leaves, a few inches below, which were much like the pectoral fins of an eel.

The location of the plant in the garden, below the dining-room windows, gave full opportunity for the observation which speedily

was bestowed upon the stranger. At first it was supposed to be the *ipomea pandurata,* as the leaves bore some resemblance to those of that vine, save in arrangement, for that of the stranger's was variable, being solitary, opposite, triple, quadruple, etc., at the nodes.

However, when the blossoms appeared the doubt was settled. The clustered two or three-inch-long racemes of minute greenish flowers pointed in a new direction. The works on botany available had no mention of it; and, after much search in books and inquiry in a variety of directions, its true identity was gained: the *Dioscorea bulbifera.*

At the bases of the leaves, soon after the blossoms withered, small round bodies appeared, which became brown at maturity and varied in size from a pea to a hazel nut. Some of these, after falling off, were planted in flower pots for future observation.

At the same time some of these bodies were sent to national headquarters with portions of the vine, leaves, and flowers, for further identification. In due time the reply came: the *Dioscorea bulbifera.* "The small, round bodies," concluded the report, "are galls, caused by the sting of insects."

On cutting a number of these "galls" open, no trace of insect life was discoverable, but for

a time everything was satisfactory, and a smile of self-derision accompanied the remembrance of the galls planted in the pots.

However, when the next spring came and some characteristic leaves sprang up in the pots and were found to proceed from the "galls," the smile grew to hilarity, so glad was I to find that in point of lack of knowledge one often has good company. Thus interest in the new-comer continued.

Year after year the long, naked stem appears, clothed at length with glossy leaves, among which no insect pests have ever been observed. An ambitious climber, if support is furnished, it will reach the second and third story of the house. When the blossoms appear the cool summer morning is scented from them with a delicate odor of cinnamon, and from this characteristic the name, Cinnamon Vine, is given by the horticulturist, who sells little packages of the bulblets to his patrons.

It is now more than ten years since observation of this plant began. Its root, the wild yam, is deeply buried in the ground, beyond the biting frost. Although it is not indigenous to the northern United States, and was not accounted hardy in that latitude, after a winter when the thermometer showed ten to fourteen degrees below zero I have seen bulblets which lay ex-

posed on the ground germinate in the spring. I call that hardy.

Nature, which seems to resolve herself into one dominant instinct to perpetuate—to multiply and replenish the earth—has wonderful methods of accommodating her productions to their environments.

The depth in the ground which the root seeks, placing it beyond the reach of the severest cold, classes this vine with the *ipomea* ("man-of-the-earth") which is one of the greatest pests of the farm. The acquired hardiness of the bulblets calls for a word of caution as to their disposal in the fall. Like the seeds of other cultivated plants which take kindly to the wild state, the morning-glory, the "lace-plant," or wild carrot, and others, they should be carefully burned. Here is a good place to apply the ounce of prevention. If carried with other refuse into the country it is certain to spread.

While pursuing my inquiries in regard to this plant, a curious reply was received from a botanist as to its classification. The letter has this remark:

"I must say that I do not know whether it should go into the State Flora or not. It does not seem to seed at all, and is not able to spread beyond the garden in which it was originally planted."

That seems very odd, since the bulblets are plainly the seed. They may be improper from a methodical botanist's point of classification, but they produce the next generation of plants. The plant is here to stay, an "ugly duckling" in a well-ordered family perhaps, but all the more interesting from its peculiarity. It should be described in works on botany, so that others, when they find it as I did, may not have so much difficulty in placing it.

So the *Dioscorea bulbifera,* acclimated to the northern part of the United States, knocks for admission to Britton and Brown's "Illustrated Flora of the Northern United States and Canada."

1900.

THE SEPTARIA.

About eleven miles north of Columbus, Ohio, the level country gives place to hills and forms a tract of such surpassing beauty, so rich in geological and botanical specimens, as to cause the wish that the Government would set it apart as a park to perpetuate to future generations a sample of the original loveliness of creation.

A short distance from the little town of Flint the meadow sweeps down to a tiny stream, known in the neighborhood as "the Branch,"

and at this point, beyond its shallow bed, a picturesque wooded hill rises abruptly to the right.

Passing the narrow footpath leading to the almost precipitous summit, and continuing along the bank of the stream, great boulders of that peculiarly hard, red granite found in the glacial channels may be observed. Arriving at the high-road which has been cut through the side of a shaley hill, we cross over into a field where, again, the hills begin to tower above us, but to the left.

Among the undergrowths here may be seen the wild gooseberry in profusion, as well as the amelanchier, or "service berry." Ferns thickly cover the slopes. Soon a point is reached where on either hand rise sheer, precipitous walls, as if the great hill had been rent asunder by seismic action, although in reality it was probably nothing more than the steady washing of the waters of the Branch, which in times of freshet are greatly increased in volume and violence of action.

On these perpendicular walls the stony secrets of the hills are revealed. Flattened spheres of rusty-colored stone, from a few inches to twelve feet or more in diameter, are exposed to view. Some of these spheres have fallen to the bed of the stream and are broken in fragments. Some have been cleft by the

hammer of the inquisitive geologist, for frequently in the center of these globe-like concretions fossil specimens have been discovered.

It was in one of these that the *Hertzeri Dinichthys* was found by Rev. Henry Hertzer, then of Delaware, Ohio.

This gorge is known locally as Fern Canyon. The Branch, after passing through this interesting channel, whose outlet of boulders is much like the terminus of a glacier on a small scale, runs sluggishly for a short distance through a strip of alluvial lowland and joins its waters to those of the Olentangy.

Upon first sight, these mysterious looking spheroids strike the mind of the novice with wonder, and never cease to be full of interest. In the Geological Survey of Ohio, Dr. Orton makes frequent reference to them, as in the following:

"One of the most conspicuous features of the Huron shale is found in the concretions, great and small, which it contains in great numbers. They begin with the formation, and in the lowermost forty feet all the varieties of their structure can be seen. The shape which the larger and more symmetrical take is that of flattened spheroids. Not infrequently two are joined together by a ligament uniting their centers. They are sometimes, but more rarely, disc-like, and many of them lack regularity of outline.

"In composition some variety is observable. Very many of the smaller ones consist of the crystallized bi-sulphide of iron, and some of them consist of a symmetrical shell or scale of this substance around a softer nucleus, which gives them a strong resemblance to an iron casting. The nodules of this kind invariably contain lime and iron, the former substances being sometimes found at the center in the shape of calc spar, and more frequently occurring in a dark semi-crystalline mineral that is quite characteristic. The iron is always intimately associated with the lime and gives to the weathered concretions the dark yellow or ochreus color that marks them all in this stage.

"Rarer substances are sometimes met in the crystalline nuclei of the concretions. Heavy spar is one of these. As is now well known, there are sometimes found in the centers of these bodies organic nuclei, and among these are some of the most interesting and remarkable fossils of the entire geological series. Wood is not uncommon, a species of ancient pine, in particular, the *dadoxylon Newberri.*"

The great fish bones, however, are the most remarkable forms to be met with here, and furnish a link in geological discovery of unique value.

The northern part of Franklin County, Ohio, is rich in the Huron shale from which these concretions are taken. They are generally partially decomposed when found, espe-

cially the larger ones, and fall to pieces when exposed to the atmosphere.

Of this shale, in which the septaria are found, Dr. Orton speaks as of great possible future value, since it is rich in carbon material. In the present condition of increasing scarcity and expense of fuel there should be a measure of interest attached to this stratum: a combination of vegetable product, or, possibly, the waste of cities with it, being one method by which its utility in that direction might be solved.

The blue clay, valuable in pottery, is also one of the shale products.

Notwithstanding many plain references to these concretions of the Huron shale, the septaria, there was still one point upon which no light was shed. Were the septaria a growth of ancient times?

There they were upon the exposed walls of Fern Canyon, from the base to the top of the hill, as if the mere production of yesterday. From hoary, old, crumbled patriarchs to mere infants of a few inches in diameter, they insistently propounded the query.

On this point I found no source of information in any book. Years passed and the question was unanswered but not forgotten. The science of geology is still in its youth, the nineteenth century having seen the greater part of

its development. Less than fifty years covers the period in which we have become acquainted with the geological formations of Ohio.

At last, having the good fortune to meet Dr. Orton, the mystery was solved. Yes, he said, the septaria are growing to-day just as they did centuries ago. Wherever the proper constituents are found the septaria gather about a nucleus. This experiment, he assured me, had been tried and the result was conclusive.

It is interesting to trace the thought of this geologist through the "Survey" on this subject. At first we hear only of nodules and "concretions," but toward the close of his researches he makes them known to us as "septaria."

An enviable task is that of the naturalist. What pleasure Nature spreads in the path of her devotee; the expectancy of the search, the unmixed joy of the discovery! There are no labors so purely delightful as those which we assume with Nature.

In fancy I can see Dr. Orton opening, for the first time, these unsullied leaves of the earth's book; his kind, bright face reflecting the fine glow of intellectual enjoyment, like light tempered through a clear porcelain vase, remembering now that he has reached that sphere where "knowledge shall vanish away" in perfect knowing.

1900.

In the study of animal development through geology more than one "missing link" has, at various times, excited the interest and research of the student. The science is still so immature and discoveries are so constantly being made, the unbiased mind holds itself in readiness for new revelations.

In the line of relationship between the batrachians and fishes, the lepidosiren, or mudfish, discovered in 1837 by Dr. Natterer, in the Amazon River, has held a controverted position, some systematists ranking it as the highest of fishes, while others class it with the reptiles. This curious animal is the only living representative of what at one time was a large and powerful class of creatures.

Mr. Hertzer, breaking into fragments the huge septaria of the Huron shale, so abundant in Delaware County, though one of the toughest and most intractable of the stony formations, was rewarded by finding the fossil bones of some creature to him then unknown.

Several of these bones were taken by him to the meeting of the American Scientific Association at Buffalo in 1866. There they were submitted to Prof. Newberry, who recognized them as belonging to the huge Ganoid fishes, altogether new to science.

Mr. Hertzer, with renewed interest in his

investigations, returned home and continued his search among the concretions. With most patient care and skill the hundreds of fragments which he found in the nuclei of these ponderous spheroids were cemented, each in its proper place.

In one septarium a head of *Dinichthys,* though somewhat dislocated, was complete in all its parts. In another was a perfect mandible, while still another contained one of the teeth of the upper jaw.

Though much broken, these specimens were carefully fitted to each other and restored to full integrity by this faithful student.

"The bones contained in these concretions," writes Prof. Newberry, "are those of gigantic fishes, larger, more powerful, and more singular in their organization than any of those immortalized by Hugh Miller. I have named the most remarkable one *Dinichthys Hertzeri,* or Hertzer's terrible fish. This name will not seem ill-chosen when I say that the fish that now bears it had a head three feet long by two feet broad, and that his under jaws were more than two feet in length and five inches deep.

"They are composed of dense, bony tissues, and are turned up anteriorly like sled-runners, the extremities of both jaws meeting to form one great triangular tooth which interlocked

with two in the upper jaw, seven inches in length and more than three inches wide.

"It is apparent from the structure of these jaws that they could easily embrace in their grasp the body of a man—perhaps of a horse—and as they were, doubtless, moved by muscles of corresponding power, they could crush such a body as we would crush an egg-shell.

"Perhaps the bony shields worn by *Dinichthys* were for the protection of the wearers against the powerful jaws of their own kin. But it is very improbable that the species was, to any great degree, self-devouring; for the double reason that cannibalism is an offense against a far-reaching law of nature, and the carapaces of even the younger individuals of *Dinichthys* must have been very hard to crack, even for the all-embracing and massive jaws of their parents and adult relatives."

At least one hundred specimens have been found in the rocks of the Devonian time, which shows that the *Dinichthys* greatly exceeds in numbers any other of its cotemporary relations. To Ohio belongs the honor of first giving to the world its discovery, but a number of specimens have since been found in Russia.

This creature was eminently carnivorous, and from the extraordinary development of its

dental apparatus it must have fed upon large and resistive animals.

Prof. Newberry secured for Columbia College, School of Mines, the fine specimen discovered by Mr. Hertzer, where it occupies a place of unique and distinctive interest.

A second species of the *Dinichthys* was discovered by Mr. Jay Terrell of Sheffield, Lorain County.

Having observed some large bones protruding from the soil on the lake shore cliffs, and finding that they were imbedded in such a manner as to render it impossible to secure them intact by horizontal digging, he excavated from above at a great expense of care and labor, his efforts being rewarded by having the new-found species named in his honor the *Dinichthys Terrelli.*

This species has since been found by others.

It would be difficult to find a region of the globe which furnishes a richer and more varied field for the naturalist than our own beautiful Ohio. The hills present opportunities for the geologist; even the level plains have their kames, or gravel-pits, in which curious formations are often found, as well as skeletons of the mastodon, here and in the swamps.

In the numerous Indian mounds the ethnologist may find objects for investigation; and there is hardly an acre of ground where the

relics of former inhabitants may not be ploughed up in the form of flint arrow heads, stone pestles, axes, mallets, pipes, beads, etc.

Already her floral wealth has become familiar through the labor of her world-famed botanists. These fields for study are all so accessible, it is surprising that there is not more touring of scientific classes from high schools and colleges during the summer months.

1900.

PASSING OF THE WILDWOOD.

It was in Duluth, a few years ago, that the fact was forcibly suggested to my attention that we are carelessly allowing the native vegetable growths of forest, vale, and water to become extinct. Near one of the docks, where a natural shallow inlet ran beside the unfinished stonework for a short distance, the graceful sedges and water-plants still flourished undisturbed.

It was in the month of July when the aquatic florae are at their best, yet in this one spot alone did I see anything to remind me that once these shores of Lake Superior had been green and luxuriant with blossoms. This, too, notwithstanding the fact that the adopted flower of the city is the calla, as I discovered when

purchasing a souvenir spoon. The iris and sagittaria spread their colored petals to the sun, the bur-reed and cat-tail lifted their forest of spears, with the pale green inflorescence sheltered from any but close observation.

There were tufts of the greater bulrush and other tall, graceful varieties of the sedge duplicated by reflection in the water.

A glimpse of nature, an object lesson for the denizens of the city, surrounded from day to day, as they are, by the works of man; why can not such spots be spared, here and there, from the general destruction of nature's original beauty, which takes place wherever a city is planted?

Nature's bounties are so various, and there is no locality in which some one of them may not be found. In one place the geological formations are rich, in another the long stretches of woodland and prairie are profuse in botanical wealth. Here it is mosses and lichens, there the peculiar growths of the seashore, with possibilities in conchology. Everywhere are birds and insects, and the larger forms of animal life.

But civilization daily encroaches upon these remnants of pristine formations, and in many localities nothing remains of nature's original construction.

In my own county I have seen her driven

from the wayside and fence-row by the hoe of the thrifty farmer, till but few spots remain in which she holds undisputed summer revel.

The obliteration of natural plant life radiates from the cities to a greater extent every year. The neat farm houses spring up within short distances of each other, the fence-rows disappear, and orderly cultivation takes the place of nature's wild luxuriance. What once the zigzag fence partially protected, the wire exposes to the hoe and plow. Instead of the wild hyacinth, clematis, cardinal flower, or pink, which decked the tangled, picturesque lines, the carrot, white-top, yarrow, or other pest of the farmer is monopolizing the beauty-forsaken wayside.

This spoliation is partly owing to the city loiterer, greedy of beauty and nature's treasures, but more from the owner of the soil who has little difficulty in eradicating everything but those persistent plant-squatters, which stand a living contradiction to the law of "survival of the fittest."

About two miles from the county seat, to the west, there is a strip of woodland which is being gradually cleared away, until now there is left less than ten acres. It is rich in the production of wild vines, trees, and flowers.

The wild grape, ampelopsis, tecoma, cle-

matis, rhus toxicodendron, smilax, and bittersweet trail from tree to tree. The dioscorea villosa flourishes here. The red-bud, dogwood, spice-bush, sassafras, elm, maple, oak and other trees are here in profusion, and to name the wild flowers that congene at their roots would require pages and pages of a botanical analysis. Many varieties of violets, the sanguinaria, meadow-rue, hydrophyllum, wake robin, Solomon's seal, Indian turnip, green dragon, silene, phlox, erythronium, mertensia, Greek valerian, lady's slipper, acteae, anemones, syndesmon, tradescantia, euphorbia, sweet cicely, several varieties of galium, with their matting of shiny pixie wheels; the Compositae, Umbilliferae, Labiatae—in short, a treasure spot to the botanist.*

A similar tract of land about a mile east of town was in one recent season transformed into a cornfield.

Doubtless each village or town has such spots of natural beauty which are swallowed up by encroaching civilization.

The work of destruction goes constantly on. Many plants once common, like the ginseng, spikenard, cimicifuga, have been appropriated by the "herb doctor," and no attempt is made to re-supply them.

Do we not owe a duty to posterity in making an attempt to save a tract like this for future

*Now a cultivated field.

students, in the neighborhood of each city, town or college? If the Government purchases and preserves the birthplace of a great man, the field of a celebrated battle, why not a strip of mother earth, rich with indigenous vegetation?

A little nature-park, hedged in from the thoughtless marauder but open to the student and lover of nature—can any acquisition be worth more to a natural history club or scientific association?

Ladies' clubs might well consider this in connection with their interest in ornithology. In a nature-park the birds flourish undisturbed; left to the precarious shelter of cultivated ground, only the tamer species are likely to remain.—*Plant World,* May, 1900.

HELIANTHUS KELLERMANII.

When August beams with sultry rays
Along luxuriant country ways,
When verdure droops and brooks are dry,
Rejoicing in the summer sky,
The Helianthus opes her gold,
Her gorgeous beauties all unfold,
And to her lord, the blazing sun,
She lifts her bright eyes, one by one.

On Darby's plains and to the west
The prairie decks her bounteous breast
With many a flower of varied hue;
And here our Sullivant and Lesquereux,

Earliest among the pioneers,
Unchecked by solitude or fears
Of deadly, lurking, savage foe,
Into these wilds devoutly go
And on this wealth of nature pore
With zeal of scientific lore.

Along Scioto's plains, I wist,
Ohio's later botanist
Has crowned his wanderings aestival,
His part in nature's festival
By blending in discovery's thought
His name with Helianthus wrought.

Oft as the boscage wild I scour
I long to hap upon some flower
By page botanical unkenned,
Whereto my name I may append,
As here along the summer lea
I find the *Sullivantii*,*
Or that *giganteum's* form obscure
Which *Kellermanii* shall endure.
But, ah! no flower unknown thus far
Has crowned my vision like a star.
Yet happy fate it were for me
To rear some flower of Poësy.

O Muse, to whom the power belongs,
Inspirer of our sylvan songs,
Grant to this verse one touch divine
To link those gracious names with mine!
August 21, 1899.

*Torrey and Grey.

THERE is a lonely grave in Guatemala where rests the body of William Ashbrook Kellerman, Ph. D., who died of malarial fever March 8, 1908. He was State Botanist at the Ohio State University, and it was while conducting explorations in mycology that he had sacrificed his life. He was a man who loved his work, and in thought and life grew close to nature.

The American Association for the Advancement of Science met at the Ohio State University in Columbus, August 21, 1899, celebrating the following day in honor of Ohio's noted botanists, living and dead.

It was my good fortune in youth to meet the dignified and thoughtful William Starling Sullivant in Columbus and to know of his refined family life; also Hon. Joseph Sullivant, his brother; to meet Leo Lesquereaux and receive a smile from his beautiful dark eyes, hearing from those about him expressions of their love and reverence; and in later life, when I took up the study of botany, to be aided by the patient and genial help of Prof. W. A. Kellerman, of the Ohio State University.

Dr. Kellerman was born in Ashville, Ohio, in 1851. He was a graduate of Cornell University in 1871, and in 1881 received the degree of Ph. D. at the University of Zurich. He occupied important positions in Wisconsin State Normal School, Kansas State Agricultural College, and Kansas State Experimental Station. He came to Ohio State University in 1891.

He was the founder of the *Journal of Mycology* and the *Ohio Mycological Bulletin.* He was the

author of "Flora of Kansas, "Spring Flora of Ohio," "Catalogue of Ohio Plants," "The Non-Indigenous Flora of Ohio," "Phyto-Theca," "Elementary Botany," etc.

Helianthus Kellermanii: Kellerman's Sunflower, is named in his honor.

Schaffner, John Henry, who succeeded to the chair of Botany at Ohio State University on the death of Dr. Kellerman, was born at Agosta, Ohio, July 8, 1866. He is President of Ohio Academy of Science and member of the National Geographic Society. He is author of a number of scientific articles contributed to the *Botanical Gazette, Journal of Applied Microscopy, Ohio Naturalist,* etc., "The Pteridophytas of Ohio," "Trees of Ohio and Surrounding Territory," etc.

Robert F. Griggs, Assistant Botanist, O. S. U., author of "The Willows of Ohio," etc.

Ohio has a creditable list of men who have devoted themselves to the study of botany. In addition to those mentioned elsewhere are the following, many of whom are men of brilliant attainments, whose names are familiar to the scientist and of whom the world is likely to know more in the future: Dr. J. S. Newberry, Dr. H. C. Beardslee, Dr. W. R. Lazenby, W. C. Werner, Jos. F. James, E. E. Bogue, Edo Classen, E. E. Fulmer, Otto Hacker, L. S. Hopkins, A. P. Morgan, J. A. Sanford, A. D. Selby, Geo. H. Shull, L. D. Stair, F. L. Stevens, F. J. Tyler, Otto E. Jennings, R. J. Webb, A. Wetzstein, A. Dachnowski, E. L. Mondey, and a number of others.

Jos. F. James, whose early death deprived the science of an earnest worker, has a carex named in his honor, and I recall the pleasure it gave me to collect the modest little plant in a low meadow a few summers ago. My interest was much increased from having had the privilege of meeting Mrs. James, her husband's able assistant, at the American Association for the Advancement of Science celebration, where, with Miss Lumina Riddle (since Mrs. B. B. Smyth, of Kansas), at that time pursuing a course in botany at the university, a memorably happy hour was passed.

Among the names of those who were active in the early botanical work of Ohio are Dr. Daniel Drake, Dr. C. G. Lloyd, John L. Riddell, A. M., Joseph Clarke, John H. Klippert, Dr. R. S. Howard, Dr. Kellogg, Dr. N. S. Townshend, Dr. John A. Warder, Dr. Jared P. Kirtland, and others.

Besides those already named above are found the following, who contributed to the collection of botanical specimens at the Ohio State University: C. L. Payne, H. L. Jones, A. A. Wright, W. Krebs, W. S. Devol, W. L. Crabaugh, E. S. Mosely, W. S. Whipps, R. H. Ingraham, W. R. Beattie, E. W. Vickers, D. L. James, W. G. Tight, G. B. Twitchell, Thos. G. Lea, J. A. Sandford, E. V. Wilcox, S. Renshaw, H. Herzer, E. W. Claypole, J. S. Hine, E. Wilkinson, Moses Craig, R. Buchanan, W. W. Deckard, M. G. Aumold, Albert Neifer, A. F. Foerste, R. E. Bower, J. S. Vandervort, Dr. H. L. True, H. G. Wolfgang, etc.

The names of the women who assisted in this work are given elsewhere.

ADANSON, MICHEL, a French naturalist of Scotch dscent, was born at Aix, April 7, 1727; died at Paris, August 3, 1806. Made a fine collection in Senegal, where he studied for five years. He assisted in opening the way for the introduction of the system of de Jussieu. The baobab tree is named Adansonia in his honor, as he was the first to give a scientific description of it.

BARRELIER, JAQUES. Born at Paris, 1606; died September 17, 1673. A French botanist. He wrote "Plantae per Galliam, Hispaniam, et Italiam observatae, etc."

BARRERE, PIERRE. Born at Perpignan about 1690; died there November 1, 1755. He studied medicine and botany; traveled in French Guiana, and on his return was Professor of Botany at Perpignan. He wrote several works on the natural history and geography of Guiana.

BENTLEY, ROBERT. Born at Hitchin, Hertfordshire, England, March 25, 1821; died December, 1893. An English botanist. His works include "Medicinal Plants," "Manual of Botany," etc.

BOCCONE, PAOLA; *later,* SYLVIO. Born at Palermo, Sicily, April 24, 1633; died near there December 22, 1794. A noted Sicilian botanist; Professor of Botany at Padua, and later a Cistercian monk.

Bocconia Cordata—Plumed Poppy.

BONNIER, GASTON. Member of the Academy of Sciences and Professor of Botany at the Sorbonne,

Paris. Author of "Flore Complete de France, Suisse, et Belgique, illustre en couleurs;" editor of "Dictionnaire de Botanique," etc.

BRITTON, NATHANIEL LORD. Born at New Dorp, Staten Island, N. Y., January 15, 1859. A prominent American Botanist, Director of the New York Botanical Gardens from 1896. Author of "Illustrated Flora of the Northern United States and Canada," "Manual of the Northern United States and Canada," etc. Hon. Addison Brown, President of the Torrey Botanical Club, assisted him.

BROMFIELD, WILLIAM ARNOLD. Author of "Flora Vectensis," 1856. Of this author I am unable to give further statistics, but take this opportunity to acknowledge the pleasure and profit the above book gave me in making the acquaintance of the flora of the Isle of Wight.

BROWN, ROBERT. Born at Montrose, Scotland, December 21, 1773; died at London, June 10, 1858. He went as naturalist of the Flinders Australian Expedition. He published works on the plants of New Holland and Australia.

CANDOLLE, AUGUSTIN PYRAMUS DE. Born at Geneva, February 4, 1778; died at Geneva, September 9, 1841. A celebrated Swiss botanist and one of the founders of the natural system of botany; a Professor of Botany and author of several important works: "Histoire des plantes grasses," "Theorie elementaire de la botanique," "Regni Vegetabilis Systema Naturale." This work was continued by

CANDOLLE, ALPHONSE LOUIS PIERRE PYRAMUS, his son, under the title "Prodromus Systematis Regni Vegetabilis, etc." He was born in Paris, October 27, 1806. Besides the continuation of the work begun by his father, mentioned above, he wrote "Geographie botanique raisonnee" (2 vols.), "Origin of Cultivated Plants," etc.

CELSIUS, OLAF. Born July 19, 1670; died at Upsala, Sweden, June 24, 1756. A Swedish botanist and theologian; instructor of Linnaeus, who first discovered his genius and was his patron. Noted for his researches in regard to plants mentioned in the Bible. In this work Linnæus assisted him for a time.

CONSTANTIN, JULIEN. Paris. Professeur au Muséum d'Histoire Naturelle et a l'École Nationale d'Horticulture. Author of "Atlas des Orchidées cultivées."

DIOSCORIDES, a medical and botanical writer of the first or second century A. D., supposed to be a native of Anazarbus in Cilicia. He traveled through Greece, Asia Minor, Italy, and Gaul, making investigations and collecting plants. He wrote a work on Materia Medica in five volumes, which has been translated from the Greek and Latin into several modern languages. The botanical family Dioscoreaceæ (the wild yam) is named in his honor.

ENGLER, ADOLF. Born at Sagan, Silesia, March 25, 1844. A noted German botanist. He is director of the Botanical Garden from 1889, and professor in the University of Berlin. Among his productions is "An Essay on the Development of the Vegetable

Kingdom," "Natural Families in the Vegetable Kingdom," etc. Engler and Prantl are authors of "Natürliche Pflanzenfamilien," a great work, in which all known genera of plants are described.

ESCHSCHOLTZ, JOHN FRIEDRICH VON. Born at Dorpat, Russia, November 12, 1793; died there May 19, 1834. He visited California early in the century. A noted German botanist and traveler, naturalist. He accompanied, as physician and naturalist, Kotzebue's expeditions in 1815-18 and 1823.

Eschscholtzia Californica—California Poppy.

FUCHS, LEONHARD. Born at Wembdingen, Bavaria, January 17, 1501; died at Tübingen, Württemberg, May 10, 1566. A German botanist and physician; author of "De Historia Stirpium," 1542. The Fuchsia is named for him, an American flowering plant, native of Mexico and South America.

GENTIUS, KING OF ILLYRIA. The Gentian family is named for him.

GODIN DES ODONAIS, JEAN, accompanied his brother Louis to Peru in 1735, and remained there as a professor in a college at Quito, studying the flora of that country as well as the Indian language. He also visited Cayenne, the Brazilian Amazon, etc. He published several works on the plants, animals, etc., of South America. He was born in Saint Amans in 1712, and died there in 1792.

GRAY, ASA. Born at Paris, Oneida Co., N. Y., November 18, 1810; died at Cambridge, Mass., January 30, 1888. Studied medicine, but gave it up for the study of botany. Was Professor of Natural His-

tory at Harvard from 1842 to 1888. With Torrey he aided in bringing the ancient botanical knowledge into conformity with the new natural system recently adopted by the leading botanists of Europe. He was especially successful in presenting botanical science to the young in a simple and attractive style. Author of "How Plants Grow," "Manual of Botany and Vegetable Physiology," illustrated by Isaac Sprague; "How Plants Behave," "Forest, Field, and Garden Botany," "Darwiniana," "New Flora of North America," etc.

GREW, NEHEMIAH. Born 1641; died March, 1712. An English botanist, noted for his studies in vegetable anatomy and physiology. His chief work, "Anatomy of Plants," was published in 1682.

HOOKER, SIR JOSEPH DALTON. Born at Glasgow, 1817. A noted English botanist, son of Sir W. J. Hooker. Author of "Florae Antarctica," "Rhododendrons of the Sikkim-Himalaya," "Flora of New Zealand," "Students' Flora of the British Islands," etc.

HOOKER, SIR WILLIAM JACKSON. Born at Norwich, England, July 6, 1785; died at Kew, near London, August 12, 1865. A noted English botanist; appointed Director at Kew in 1841. Author of "British Jungermanniae," "Flora Scotica," "Icones Plantarum," "Species Filicum," etc.

JUBA II, son of Juba I, made King of Numidia 30 B. C., and transferred to Mauretania 25 B. C. Noted as a historical and general writer.

Juba's Bush, or the Iresine.

JUSSIEU, BERNARD DE. Born at Lyons, France, August 17, 1699; died at Paris, November 6, 1776. With Antoine L. the founder of the natural system of botany. At first a physician, he at length devoted his entire time to botany. He took charge of the gardens of the Trianon in 1758.

JUSSIEU, ANTOINE LAURENT DE. Born at Lyons, France, April 12, 1748; died at Paris, September 17, 1836. A noted French botanist, nephew of Bernard. Author of the following: "Genera plantarum secundum ordines naturales," etc., "Introductio in historiam plantarum," "Exposition d'un nouvel ordre de plantes, adopte dans les demonstrations du jardin royal" (1774).

JUSSIEU, ADRIEN DE. Born at Paris, France, December 23, 1797; died there June 29, 1853. A noted French botanist, son of the preceding. He wrote "Cours elementaire de la botanique," and monographs on the Rutaceæ, Meliaceæ, Malphigiaceæ, etc.

JUSSIEU, JOSEPH DE. Born in 1704; died April 11, 1779. He went to Peru with La Condamine and Godin. He made a special study of the cinchona, spending fifteen years in collecting the flora of that region. Through the dishonesty of a servant he lost this, and his mind became unbalanced in consequence. He returned to Paris, where he died.

Jussieaea—Primrose Willow.

LESQUEREUX, LEO, was born at Fleurier, Neufchâtel, November 18, 1806. He was of French Huguenot ancestry. He followed the trade of jeweler, his father

having been a manufacturer of watch-springs. Owing to delicate health, his mother desired that he should become a minister of the gospel. He attended the Academy of Neufchâtel, where he became the intimate companion and fellow-student of Guyot.

The King of Prussia engaged his services in the exploration of the peat bogs of Northern Europe, and his education in the study of botany, geology, etc., was greatly assisted. Of paleobotany, in which he was subsequently to become an active worker and explorer, he here acquired his earliest knowledge.

In 1848 he came to America, going first to Boston, where he was a member of the household of Agassiz, working on the botanical part of Agassiz's "Journey to Lake Superior." At the invitation of W. S. Sullivant he came to Columbus in the winter of that year, and continued his studies of mosses, making a tour of the mountains of the Southern States. "Musci Americani Exsiccati," by W. S. Sullivant and L. Lesquereux, one of the most valuable contributions to bryology, was the fruit of this labor.

Lesquerella, Bladder-Pod.

LINDLEY, JOHN. Born at Catton, near Norwich, February 5, 1799; died November 1, 1865. A noted English botanist, author of "Synopsis of the British Flora," etc.; editor of the "Botanical Register," of the "Gardeners' Chronicle," etc.

LINNÆUS, CAROLUS (CARL VON LINNE). Born near Stenbrohult in the Province of Smaland, Sweden, May 24, 1707; died in Upsal, January 10, 1778. He inherited his love of flowers from his father, who was

a Protestant minister in Stenbrohult, beginning almost in infancy the study of plants, which finally won for him his place as founder of the "Linnæan System" in botany. He made a visit to Lapland, lived a few years in the Netherlands, at work upon his favorite study, becoming a professor of medicine, and later of botany.

He underwent much deprivation and poverty, but his talents and devotion were finally rewarded by the king, who bestowed upon him the honor of Knighthood and gave him positions of trust suitable to his attainments in science. At one time he visited Paris, where he met the Jussieus, acknowledging without envy the superiority of the new system of botany which was destined to supersede his own.

His principal works are: "Systema naturæ," 1735; "Fundamenta botanica," 1737; "Genera plantarum," 1737; "Flora lapponica," 1737; "Philosophia botanica," 1751; "Species plantarum," 1753, etc.

Sex in plants was the foundation of the Linnæan System, but it has long been replaced by the natural system of the De Condolles and the De Jussieus, which made like structure and affinity of parts the foundation of classification.

Linnæa, or Twin-flower.

Elizabeth Christina von Linne was the only one of her father's five children who inherited any of his genius. "She was the first naturalist to observe the inflammability of exhalations of certain plants and the electric sparks to be drawn from the nasturtium."

LOBEL, or L'OBEL, MATTHIAS, born near Lille, 1538; died near London, 1616. Emigrated to England, where he became botanist to James I and had charge of a garden of medicinal plants. Author of some bontanical works.

Lobelia is named for him.

MARTYN, JOHN. Born in London, England, September 12, 1699; died at Chelsea, January 29, 1768. Author of "Historia plantarum variorum;" Professor of Botany at Cambridge.

Martynia Louisiana, Unicorn-Plant, or Double-Claw, is named in his honor.

MICHAUX, I., ANDRE, a French botanist, born at Versailles, March 7, 1746, died in Madagascar, November 13, 1802. He was a pupil of Bernard de Jussieu in the Jardin des Plantes, and associated with Lamarck and Thouin in their botanical expeditions. He traveled in the Pyrenees, and subsequently in Persia, where he remained two years making botanical collections and studies. In 1785 he was commissioned by the French Government to make a journey through North America, and he established botanic gardens near Charleston and New York City. He sent home great quantities of plants, trees, and seeds. A plantation to which he had contributed 60,000 young trees was destroyed during the French Revolution. On returning to France, 1796, he was shipwrecked and most of his collections were lost. In 1800 he joined an expedition to Australia, but left it at the Isle of France and went to Madagascar, where he died. Two works, "A History of the Oaks of North Amer-

ica" and "Flora of North America," comprise his published writings.

MICHAUX, II., FRANCOIS ANDRE, son of the preceding, a French botanist, was born at Versailles in 1770, died at Vaureal, October 23, 1855. He made three trips, in the employ of the government, to North America, to ascertain what species of trees would bear transplanting to Europe. His principal work is "History of the Forest Trees of North America." To this was added by Thomas Nuttall three volumes containing the trees not included in the work by Michaux.

NUTTALL, THOMAS, born at Settle, Yorkshire, England, 1786; died at St. Helens, Lancashire, England, September 10, 1859. In America from 1807 to 1842. Was appointed Curator of the Botanical Garden at Harvard University in 1822. He wrote: "Genera of North American Plants," "The North American Sylva," "Manual of Ornithology of United States and Canada," "Journal of Travels in Arkansas Territory in 1819."

PURSH, FREDERICK. Born in Tobolsk, Siberia, in 1774; died in Montreal, Canada, June 11, 1820. He was educated at Dresden, came to America in 1799, and spent twelve years in botanical explorations. In 1811 he visited England and published "Flora of North America." He was engaged in the collection of materials for a flora of Canada when he died.

RIDDELL, JOHN L., Ohio botanist.

RUDBECK, OLAUS (1630-1702), founder of the botanical garden at Upsala, 1657; his son, Olaus

(1660-1740), and a relative, Olaus John Rudbeck, all Swedish botanical writers.

Rudbeckia, named in honor of the first by Linneus.

SOLOMON, KING OF ISRAEL (993-953 B. C.) Solomon's Seal is named in his honor.

SULLIVANT, WILLIAM STARLING. Born near Columbus, Ohio, January 15, 1803; died there April 30, 1873. An American botanist, noted as a bryologist. He wrote "Musci Alleghaniensis" (1845), "Musci and Hepaticæ of the United States, East of the Mississippi River" (1856), and "Icones muscorum" (1864). He was assisted in his work by Leo Lesquereux.

Sullivantia Sullivantii, Sullivantia.

THEOPHRASTUS (374-287 B. C.), a Greek philosopher and a disciple of Aristotle. He left two botanical works: "Researches about Plants," in nine books, and "Principles of Vegetable Life," in six books, which show he was a close student of nature.

THUNBERG, KARL PETER. Born at Jonkoping, Sweden, November 11, 1743; died at Upsala, August 8, 1828. A pupil of Linnæus. Author of "Flora Japonica," "Flora Capensis," etc.

Thunbergia.

TORREY, JOHN. Born in New York, August 15, 1796; died in New York, March 10, 1873. An American botanist and chemist. He was professor at Princeton and in the College of Physicians and Surgeons, N. Y. He was State Geologist for New York, and also State Assayer. He was botanical editor of reports of various expeditions of exploration. Pub-

lished "Catalogue of Plants Growing Spontaneously within Thirty Miles of the City of New York," "Flora of the State of New York;" "Flora of Northern and Middle States," "Flora of North America," with Asa Gray.

TOURNEFORT, JOSEPH PITTON DE. Born at Aix, France, June 5, 1656; died November 28, 1708. A noted French botanist, Professor of Botany at the Royal Garden of Plants from 1683. His chief work is "Institutiones rei herberiæ."

WILLDENOW, KARL LUDWIG. A German botanist born in Berlin in 1765; died there July 10, 1812. Professor of Natural History at the medical college, Berlin, 1798-1812. His chief works are "Grundriss der Kräuterkunde" and a new edition of "Linnæus's Specie Plantarum," with the addition of plants discovered since the publication of that work in 1753.

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